HIB-GA 37
November 1958
Volume 6 : 37

E K I S T I C S

HOUSING & PLANNING ABSTRACTS

Published for private circulation by
DOXIADIS ASSOCIATES
Consulting Engineers
Lykavittou Strat. Syndesmou
ATHENS, GREECE. Tel: 616.111

Editor:

Prof. J. Tyrwhitt, 7 Sumner Road, Cambridge, Mass., USA

Dymaxion map on cover by Buckminster Fuller, Patent 2393676

TABLE OF CONTENTS

-:-:-:-:-:-:-:-

EDITORIAL 191

I. HOUSING

The work of INA-Casa in the field of low-cost Italian housing. (with illustrations p. 195 and p. 197) — Gilbert Herbert — 194

Comparative costs of flats and houses (part one) — Royal Institution of Chartered Surveyors (Great Britain) — 198

Housing problems in regional planning — V. Nørby & the Int. Federation for Housing & Town Planning. — 202

Housing in relation to regional development in Asia and the Far East. (with table p. 206) — United Nations ECAFE, Secretariat. — 204

II. PLANNING

Urban planning in Pakistan — Ahmed M. Ali — 208

Comments and suggestions for a school of regional planning. — Hans Blumenfeld — 211

Problems of urbanization and community development in changing societies. — Audrey I. Richards — 215

Report of the Tokyo planning seminar — United Nations, TAA, ECAFE, and Bureau of Social Affairs. — 219

III. CONSTRUCTION

Sand-vibration reduces foundation costs 20% (with illustration p. 232) — Edward H. Wells — 230

Pakistan's huge earth dam (with illustration) — Engineering News Record — 233

Building "the world's toughest" dam — World's Business — 234

IV. GENERAL

Industrialization problems in the tropics — Jocelyn G. Clark — 238

Private enterprise and economic development — Karl von Vorys — 243

V. APPENDIX: THE WORK OF DOXIADIS ASSOCIATES

The future of Kerbala, Iraq, 1958. (with illustrations) — Doxiadis Associates — 246

Classification system used by Doxiadis Associates — 275

EDITORIAL

-:-:-:-

About half the articles abstracted in this issue of Ekistics are drawn from papers presented to one of the three international congresses held this summer on Town and Regional Planning: the United Nations Seminar on Regional Planning in Tokyo, Japan, the IFHTP (International Federation of Housing and Planning) in Liège, Belgium, the Town and Country Planning Summer School in Bangor, Britain.

Housing:

The difficulties of speaking meangfully about housing upon a regional (as opposed to a local) scale are brought out by Viggo Nørby of Denmark who summarized the answers received from a number of regions and nations regarding the place of housing in regional planning schemes, to the International Federation of Housing Planning Questionnaire. Discussion of these points was enlarged upon by delegates to the congress of the IFHTP in Liège, Belgium. Stress was laid on the importance of adequate preliminary surveys of need.

The secretariat of ECAFE (The Economic Commission for Asia and the Far East) prepared an authoritative paper for the Tokyo conference on housing in relation to regional development briging out the importance of long term preventative action as opposed to short term remedial measures. In the first category they would place a ban upon new large-scale industries establishing themselve within urban areas; would increase the prevision of social and educational facilities in the smaller towns, and would set up new towns for new large industries. They consider the building of much new housing in or near already congested towns as purely a short term remedial expedient.

Two articles not taken from conference papers are on the very considerable achievements in Italy of the nationally sponsored INA-Casa in the field of low cost housing which is of possible application elsewhere and a minute comparison of construction costs of flats and houses in Great Britain being more expensive in that country.

Planning:

The most important article in this section is undoubtedly the summary of the final report of the United Nations Seminar on Regional planning. This gives an idea of the very wide scope of this meeting and herhaps a few of the high lights may be extracted here.

This Report (and the Seminar) discussed five major topics, under the heads of economic factors, social factors, physical factors and administrative factors.

The first topic tackled was that of the Current Trends and the findings of the seminar included the importance of combatting the growing disparity between social and economic standards of living in the villages and the urban areas; the need to bring developments in education and public health into live with the actual economic and administrative situation and the importance of provising for alternatives in all physical plans.

The report on Metropolitan Areas emphasized the current low production per capita; the importance of long-term objectives; the need for the physical Master Plan to be designed so as to promote and facilitate economic growth and the value

of the maximum participation of the general population in the planning process.

The Rural Areas report brought out the need for alternative employment, other than in agriculture; the demand for amenities comparable with those in urban areas; the importance of giving priority to the provision of water supply, roads and the preparation of overall master plans rather than rushing headlong into a village housing program (whether self-help or not). This, by the way, was probably the most valuable finding of the United Nations Seminar on Housing and Planning in Delhi in 1954, and it was good to have it further emphasized in Tokyo.

The Resources Report discussed the fact that the program of resource development must be closely bound up with the economic goals of the country; the overriding importance of good transportation network; the need to stimulate capital formation; and the need for international co-operation in developing resources which lie across national frontiers and the importance of a periodic re-evaluation of programs and goals.

On the Location of Industry it was reported that the values of the best economic development of the whole country should be kept constantly in mind when considering the immediate values of centralization; that as far as possible new industries should be located near the new sources of power (usually hydro-electric); that governments should consider a number of forms of financial incentives to encourage nationally advantageous location of industries, such as the provision of site facilities, tax concessions, etc.

From the Bangor Summer School we draw Audrey Richards insightful discussion of urbanization problems and community development in changing societies. Many items on Dr. Richards' list of the social difficulties facing the establishment of urban settlements in Africa have relevance elsewhere, especially perhaps the newcomers:

a. Unfamiliarity with urban moves,
b. Language problems,
c. Constantly shifting population,
d. Rapid change in desirable standards,
e. Resistance to administration stemming from an alien power.

Another article of more than temporary interest is Hans Blumenfeld's thoughtful comments on the curriculum for the Puerto Rico School of Planning. He emphasizes the importance of provising instruction both for university students and men already in practice and advocates a one year course, leading to a certificate, plus a second year (concentrating more on political structure and administration) which would lead to a degree. Throughout he recognizes the existence of two kinds of planners: those primarily concerned with social-economic development and those primarily concerned with physical design.

Construction:

Edward Wells' article on the use of compacted sand poles for foundations clearly contains possibilities of wider application as also does a description of the purchasing procedures employed in the construction of the huge Bhakra dam in India.

General:

Of more general application to the planning process in underdeveloped countries are Jocelyn Clark's statement on industrialization problems in the tropics and Karl von Vorys postulate of the role of private enterprise in economic development.

EKISTICS is compiled by Yvette and Lawrence Mann under the direction of Prof. J. Tyrwhitt. Enquiries or comments should be addressed to 7 Sumner Road, Cambridge, Massachusetts, USA.

NOTE: The lettering at the top of each page refers to Doxiadis Associates system of classification. The figures below each title refer to the Universal Decimal Classification.

HOUSING

C.E.O.T.

Herbert, Gilbert.
THE WORK OF INA-CASA IN THE FIELD OF LOW-COST ITALIAN HOUSING
South African Architectural Record, July 1958, pp. 23-34. Illustrations.
728 (45)

1. This is a survey of the work of the major contributor among the public and semi-public bodies participating in housing and the new architecture in Italy.

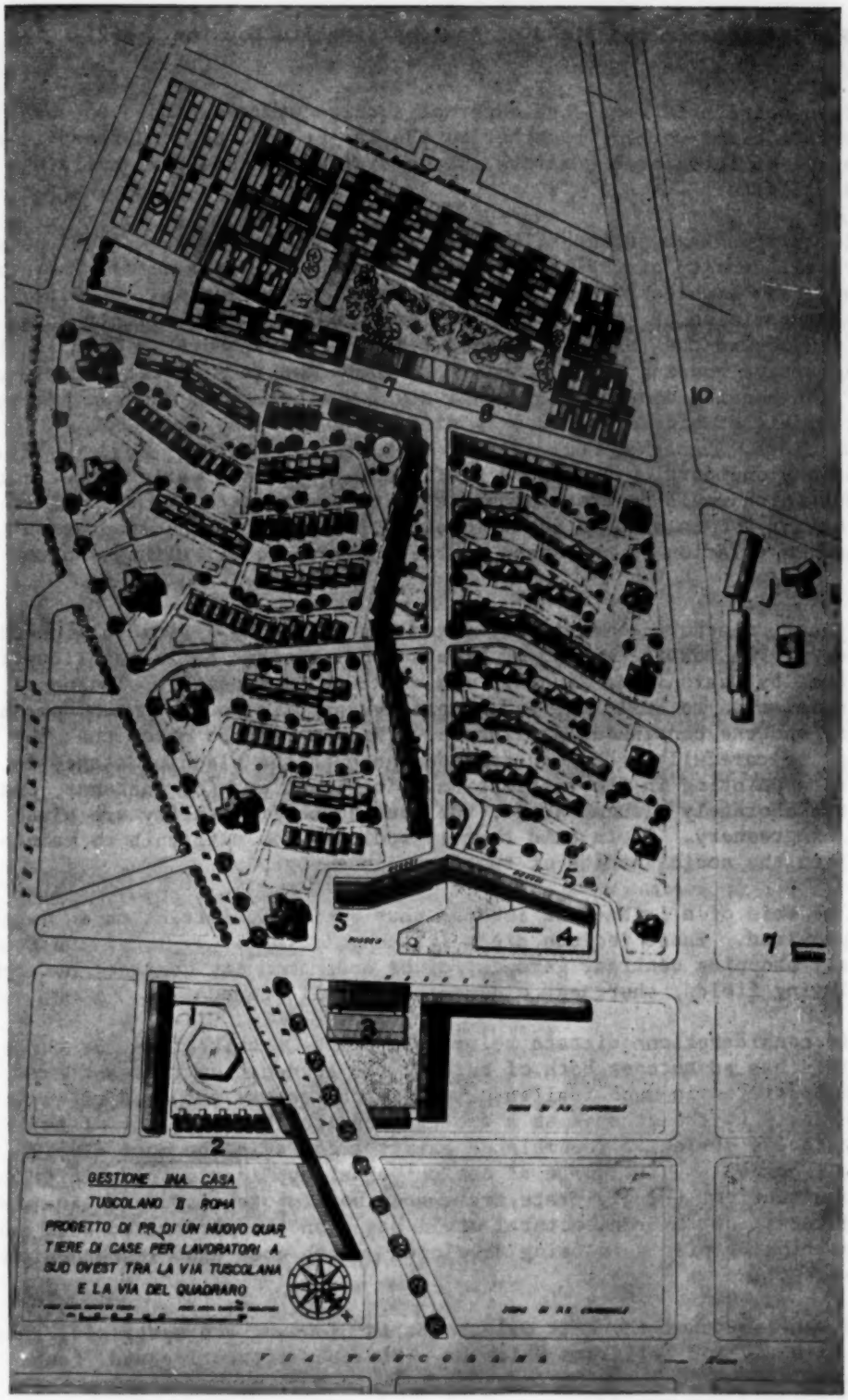
2. INA-Casa is a non-profit housing organization set up, largely on the initiative of the architects of Italy, to cope with the considerable housing shortage after the war. The task confronting INA-Casa, when it began operations in 1949, was huge, with the accumulated housing shortage of the war years and the continued urbanization of Italy's growing population in the immediate post-war era. Today, in the struggle to house Italy's vast underprivileged population groups, INA-Casa stands out. Although certain Italian cities such as Genoa and Milan have made notable local contributions, the greatest impact on the housing problem has been made by INA-Casa, which builds probably more low-cost housing than all other housing authorities taken together. In the first seven-year programme completed in 1956, some 160,000 dwellings, comprising 800,000 rooms, have been built in more that 4,200 communities.

3. The organization of INA-Casa is highly specialized and decentralized. It functions very effectively on a regional basis, under the general direction of the main office in Rome. It works in close collaboration with the Instituto Nazionale delle Assicurazione (INA), which handles most of the legal, financial and administrative aspects of the INA-Casa's work. The funds for building are drawn from three major sources. There is an obligatory contribution by all employers (1.2% of all salaries paid out); there is a similar contribution by all workers (0.6% of wages received); and there is a proportional state subsidy which average about 15 milliard lire annually.

4. The large scale of operations and careful attention to economy in the planning stage have kept the cost of construction (including all services, community facilities and site development) within reasonable limits, ranging from about $560 to $640 per room. The low initial cost of construction permits modest rentals, which for a typical flat of three rooms plus kitchen and bath-room work out to $9 and $12 per month. These rentals allow the tenant to purchase the property he occupies and amortize the loan in 25 years; he pays off about three-quarters of the actual cost and the State assumes responsibility for the remainder.

5. Although the emphasis has necessarily been upon economy of planning and construction and upon quantity of output, quality has never been sacrificed. To further a policy of quality first, INA-Casa has used the services of 900 architects and 1100 engineers. Including those commissioned for site supervisation and for on-site labor direction, its patronage during the seven year period has been extended to one in every three of Italy's 17,000 architects and engineers. Famous names in the service of INA-Casa have been Figini, Pollini, Gio Ponti, Lingeri, Gelgioioso, Gardella, Rogers, Ridolfi and Quaroni.

6. INA-Casa maintains its own technical office of some 40 architects and engineers, whose work is primarily in the field of space-utilization studies, circulation analyses, structural and technical studies, for the establishment of standards and prototypes for the guidance of commissioned architects. This


GESTIONE INA CASA
TUSCOLANO II ROMA
PROGETTO DI PR. DI UN NUOVO QUAR
TIERE DI CASE PER LAVORATORI A
SUD OVEST TRA LA VIA TUSCOLANA
E LA VIA DEL QUADRARO

LEGEND

1. Market.
2. Artisans' workshops.
3. Offices.
4. Cinema.
5. Shops for occasional use.
6. Underground garage.
7. Shops in daily use.
8. Garage.
9. Area for elementary school.
10. Sports fields.

collaboration between internal and external architects is extended to cover various private firms working together on the larger schemes, and there is a healthy degree of integrated teamwork in the design of individual buildings in the overall plan.

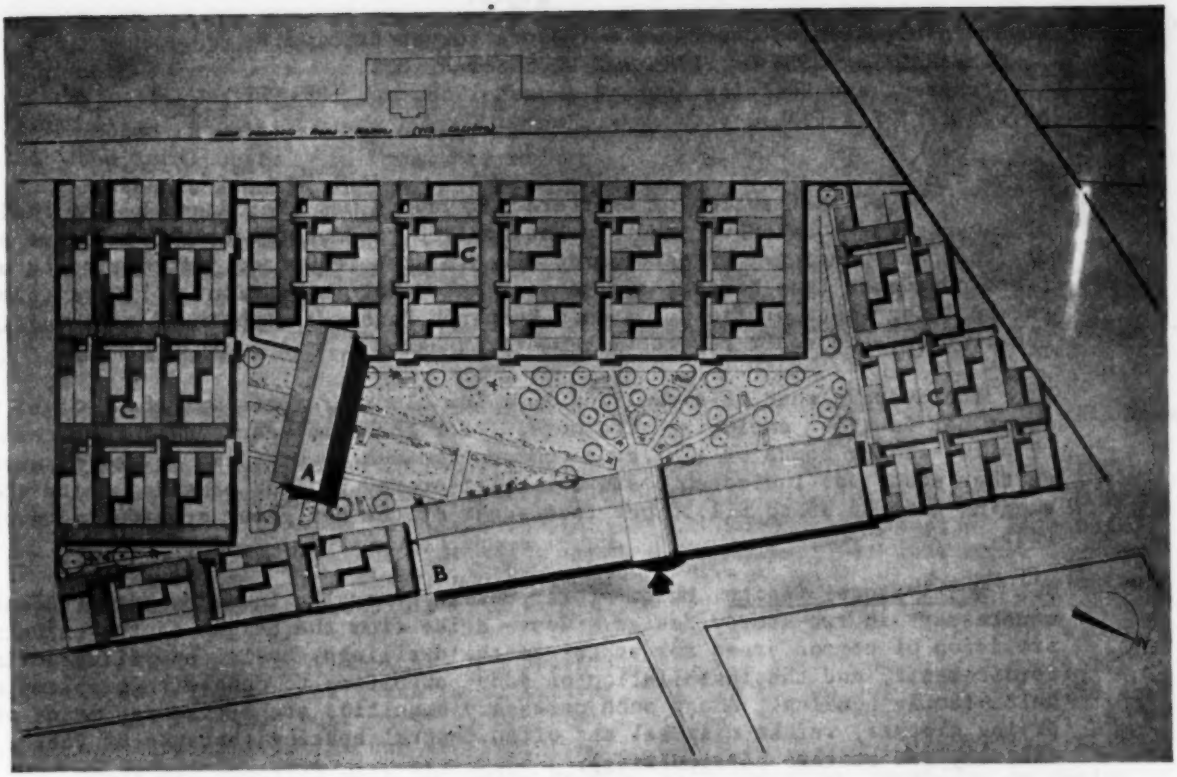
7. In schemes of this magnitude (Tuscolano, for example, houses 25,000 people with an overall density of 500 persons per hectare or 200 per acre). The problem expands from architecture into the sphere of town planning. Density, use of site, the provision of services, vehicular access: these have all been carefully studies in the INA-Casa schemes. Monotony, the bugbear of most high-density repetitive housing schemes, has been combatted in a variety of ways. Basically the housing consists of relatively low apartment blocks and these are offset by higher blocks judiciously placed. (Tuscolano, exceptionally, has no high buildings. Shapes of building and architecture character vary within the confines of any one particular scheme;sufficient to provide variety, but not to an extent which would destroy the basic unity of character in the entire project. Colour too is used to avoid monotony, and changes in orientation and alignment in relation to the street pattern give added liveliness to the schemes.

8. All layouts, whether geometrically formalist as in the Figini-Pollini-Gio Ponti scheme at Via Dessié Milan, or plastic and romantic as in the Tiburtino scheme in Rome by Quaroni and Ridolfi, are marked by a sensitive placing of building in relation to building, and a positive handling of the open spaces, the piazzas, and the continuous park strips. But it must be noted that the landscaping, so carefully and adequately designed in the planning stage, is sometimes disappointing in the realization. In Tiburtino, for instance, one of the most elaborately planned areas, the open spaces in reality are bleak and devoid of greenery. It is said that it would be too difficult to maintain planting given the social habits of the lower income groups.

9. In can be said of all INA-Casa schemes that social facilities on an extended scale are provided. These include sites for schools (built by local and State authorities); shopping centres; garages; clubs and community centres; nursery schools; playing fields; churches; cinemas; and public gardens.

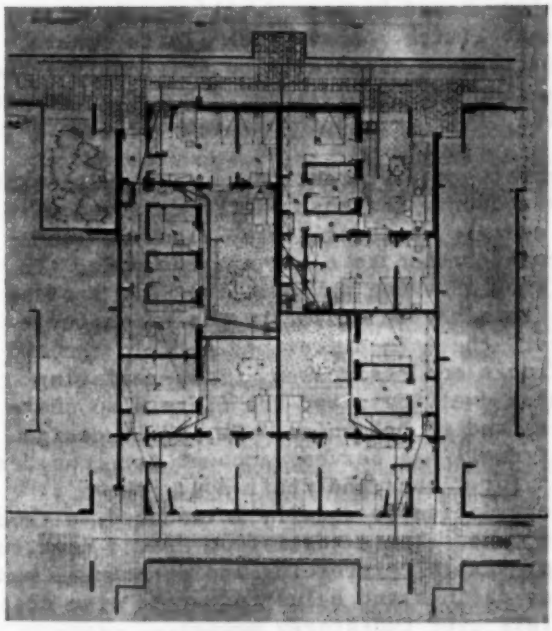
10. Economic considerations dictate relatively simple architecture for these layouts. This has advantages both of curbing the somewhat extravagant exuberance demonstrated in much Italian private architecture and also of giving breadth and unity to the schemes as a whole. Despite the disparity of individual architect's styles, a resemblance exists among even the most diverse of INA-Casa schemes. In spite of the universal application of reinforced concrete construction, the egg-crate frame does not impose its discipline upon the architecture; and an architectural style based on the perforated wall and the justaposition of planes is being developed, which goes hand in hand with a plastic sense.

11. Within the limits of economic exigencies in planning and materials, the architects have devised buildings which are efficient, attractive and fresh. Values of simplicity coupled with imagination, based on sound planning principles, combine to make INA-Casa contributor, not only to the social well-being of the Italian working classes, but also to the development of the concepts of contemporary architecture in Italy.

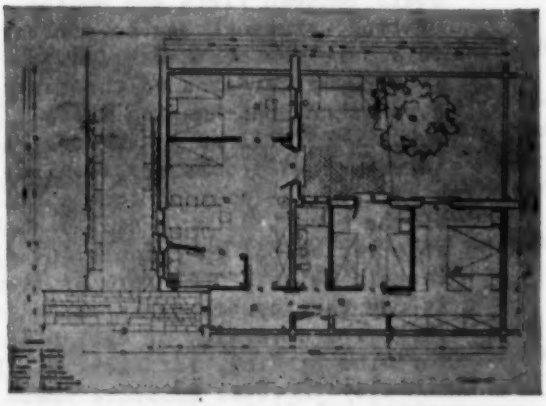


SOUTHERN PORTION OF TUSCOLANO II Architect: Adalberto Libera.

A. Corridor Access Flat Block. B. Shops. C. Single storey patio housing.



At left and below: Detailed plans of group and single unit, single storey patio houses.



E.N.T.

Royal Institution of Chartered Surveyors (Great Britian).
COMPARATIVE COSTS OF FLATS AND HOUSES-PART ONE
Architect and Building News, 6 August 1958, pp. 189-194.
69.003.12 : 728 (420)

1. The Royal Institution of Chartered Surveyors was challenged by the Minister of Housing and Local Government in March, 1956 to investigate the relative costs of flats and housing. In particular the Minister requested information on why flats cost more than houses, and he also asked for suggestions for ways to reduce the building costs of flats. A Cost Research Panel was appointed to investigate the problem, and their report is summarized below.

2. The average cost of a dwelling in a low block of flats was about $5.65 foot super net in 1954, excluding site works. For the same year the average cost of a two-storey house of similar accommodation was about $3.95 per sq ft super. Further study has indicated costs for multi-storey housing of six or more storeys ranging from $6.35 to $12.55 per foot super of the net floor area during early 1955.

3. Multi-Storey Design. Multi-storey design generally involves certain features unnecessary in two-storey design. Costs arise from the height of the structure, provision of common areas for access to the dwellings, by-law and fireproofing requirements, and the installation of added amenities to cope with problems of multi-family housing. Among such necessary amenities are elevators, means of drying clothes, refuse disposal and often central heating (because of fuel delivery and storage difficulties).

4. Comparison of Costs of Substructure. Site conditions, regardless of type of block erected, influence substructure costs. Foundations of two-storey dwellings generally could support greater loads than they do; and some economy results from the substructure cost being shared by more dwellings in multi-storey development, up to certain height limits. Above such limits, where greater weight demands stronger foundations -- especially on poor soil -- the saving is less. Designs in slab form also frequently involve building across coutours, which brings extra excavation, filling and foundation costs.

5. Superstructure. Highly variable between different designs of multi-storey flats, the cost of the superstructure accounts for most of the difference in costs between flats and houses. For example, a three-storey block in load-bearing brickwork may be similar in construction to a two-storey house: In this case the cost of brickwork will show a saving per dwelling unit because of the smaller area of the flats, but this may be offset by the necessity to strengthen load-bearing walls. However, the main difference between the two structures will be in the design of floors and staircases. Fire-resisting intermediate floors are required between dwellings, and the flats also share a part of the cost of access staircases and of balconies. The basic design of the block, as well as the number of dwellings served, account for considerable variations in proportions of cost for floors and stairways. Above a certain height, some form of frame construction is usually introduced, although it may vary considerably as to form or type. Extra costs from framed construction reflect a diversity of design problems: extra reinforcing and structural members for wind bracing, for example. Balcony facings and balustrades are also costly, and they increase relative costs of flats over two-storey houses.

Royal Institution of Chartered Surveyors. Comparative costs of flats & houses -2

6. Roofs. Some reduction in the per dwelling cost of the roof may be expected in multi-storey design as a consequence of having more flats to share the total costs. In lower blocks, (up to three-storey units) where roof design is usually similar to that of two-storey houses, such savings were found. With the higher block of flats, the fundamentally different design of the roof eliminates some such savings. Certain special savings are possible in the construction of roofs for houses: Savings in costs of brickwork can result from the lowering of the wall plate, and the careful design of roof structure will result in reduction of scantlings and costs. Neither of these economies can be applied to a similar extent with flats.

7. Internal Finishes and Joinery Fittings. There is a great deal of variation between kinds of flats as to internal finishes (up to 55%). For flats, the internal finish often includes the finishing of concrete floors, which are not normally found in two-storey houses. Also, each flat shares a proportion of the cost of finishes to access and circulation areas. The cost of fittings in multi-storeyed dwellings generally shows a higher cost per foot super because flats are usually smaller; and therefore it is necessary to provide additional cupboard and storage space as a standard.

8. Heating and Plumbing. All dwellings studied were heated by open coal fires. The cost of these in multi-storey design is increased by the extra cost of stacks which must pass through each dwelling above. Some future savings may develop from the use of shunt flues. Where central heating was installed, costs per dwelling were increased between $280 and $700, depending on design and type of installation. Where hot water was provided centrally in multi-storey design, costs are generally high because of need for larger pipes and additional stop-cock control. Some reduction in costs with multi-storey design can be expected with the introduction of single stack drainage for blocks up to five storeys.

9. Elevators. At five or six storeys an elevator is required, and another is usually introduced at seven or eight to maintain continuity of service. Extra costs involved in elevators cannot be satisfactoraly separated in analysis from the superstructure. Elevator costs are influenced by the number of dwellings, but too often it is found that an elevator is serving only 2 to 4 families on each floor.

10. Electrical and Dwelling Amenities. In multi-storey dwellings the provision of heavier mains and switch gear and of additional lighting and power points increase the cost. Also, each flat shares part of the cost of lighting installation for access balconies and staircases. The problems of clothes drying and refuse disposal increase the costs of flats. The provision of gas drying cabinets, or the setting aside of external areas for this purpose involve increased costs for multi-storey blocks. In high blocks of flats, some sort of refuse disposal is necessary; and both gravity chutes and the more advantageous mechanical disposal units contribute significantly to the costs of flats as opposed to houses.

11. Site Works. A two-storey house is generally complete within its own fence, with additional site work needed only for roads, sewers and other services. Site works are much more extensive for flats, involving costs for landscaping, secondary roads, various shelters, playgrounds, etc. High land cost usually means that some sort of multi-storey construction is necessary.

Royal Institution of Chartered Surveyors. Comparative costs of flats... --3

12. Conclusions. Because of the effect of special features in the design and contracting of multi-storey housing, it is to be expected that high block development will involve higher building costs. Although both two-storey and multi-storey housing design have a basic similarity in that they provide a solution to housing needs, the special features of multi-storey design make it fundamentally dissimilar to traditional two-storey housing, both in character and costs. The disturbing feature of the cost of multi-storey housing is not the extra cost involved over two-storey housing but the wide range of cost incurred for different schemes of development. An indication of this range, excluding the extremes of cost found, is given in the table below, based on information collected by the Building Research Station.

Range of cost per foot super net multi-storey housing blocks (Middle 2/3 of sample):

Number of Storeys	Range (in shillings) of costs per foot Super net	
	Low	High
3	33.2	46.8 *
4	39.0	53.5
5	48.1	57.9
6	55.5	69.0

It is thought that this range indicates that too many schemes of multi-storey development are costing more than necessary. Usually this is due to uneconomic design. The fact that two-storey housing in some Continential countries is relatively high would seem to be due to the provision of basements, central heating and other amenities not normally provided in England.

13. Although it is to be expected that flats will be more expensive, there is ample scope for reduction in the cost of flats. The principle recommendation for reducing the cost of high density development is that cost should be a planned factor and should be closely watched from the inception of the scheme to its completion.

a. Budget Limits. It is considered that a realistic cost approach by local authorities is essential if costs are to be cut. So the local authorities should give their architects, as part of the initial brief, a clear and unambiguous cost limit as a budget total, within which to design the scheme.

b. Ceiling Prices. There may be a danger of conflict between budget totals and ceiling prices set by the Ministry of Housing and Local Government. The Ministry should provide consultants to set a limit of cost for their architects. Early consultations are recommended.

c. Pre-contract Planning. Since failure to allow adequate time for preparation and investigation is a major cause of high building costs, it is recommended that local authorities arrange their building programmes so that adequate time is allowed for proper investigation and consideration of all aspects of design.

*20 shillings = $2.80

Royal Institution of Chartered Surveyors. Comparative costs of flats... --4

d. Cost Information and Cost Planning. Because it is important for the architect to have access to cost information during all stages of the design, it is recommended that the quantity surveyor should be appointed in time to co-operate during the initial stages of design. Money can be saved in cost planning by:

I. The exploitation of economies possible in correct site development and in the design of multi-storey housing; and

II. In the selection of the correct material or method of construction for the implementation of the design.

Thus it is recommended that the architect and the quantity surveyor, in collaboration with other consultants, should adopt some system of cost planning during the working out of the design.

e. Nomination of Specialist Sub-contractors. Concern is expressed over the high proportion of work for which specialist sub-contractors are nominated and the effect this has on costs, and it is recommended that the nomination of specialists be reduced to a minimum. Where nomination cannot be avoided, quotations should be carefully checked and contrasted for cost efficiency against alternative methods before acceptance.

f. Bills of Quantities. If practical economies are planned by special methods of construction, the use of unusual materials, or through extensive repetition of structural components, fittings and finishings, it is essential that these are properly described in the bills of quantities. It is thus recommended that quantity surveyors should ensure that the descriptions of all items in the bills of quantities are in every way adequate to provide a clear basis for pricing.

g. Building Cost Research. It is found that there are a number of problems related to multi-storey housing costs (many of which apply to other types of building development) which require further investigation. It is therefore recommended that consideration should be given to the promotion and financing of necessary research projects and the extension and co-ordination of research in the many aspects of building at present being undertaken by a number of organizations and individuals.

14. A special set of cost analyses developed by a chartered quantity surveyor and dealing with different types of housing will be printed soon in the same periodical, and EKISTICS hopes to reproduce much of this material in a forthcoming issue.

D.E.H.O.

Nørby, V. and the International Federation for Housing and Town Planning.
HOUSING PROBLEMS IN REGIONAL PLANNING
in Planning and Housing Problems in the Region, XXIVth International Congress for Housing and Town Planning, Liège, Belgium, 31 August, 1958.
728 : 711.58 (100)

1. This is Mr. Nørby's report on the housing questions, part of a survey of regional planning activity answered by 39 nations or regions thereof. Mr. Nørby is with the Ministry of Housing in Denmark. Besides presenting a summary of the findings, we include here some of the discussion which took place at the Congress.

2. The following points were summarized by Mr. Nørby from his published discussion of the survey.

a. The housing problem is often the main preoccupation of regional planning, owing to its very special human, technical and economic implications.

b. The work of surveys and of drawing up programmes is generally the responsibility of regional authorities, but the execution falls either to the municipalities or to the State and only in rare cases to a regional institution.

c. The problem of financing, undoubtedly because of the importance of housing in national economies, is usually the responsibility of the central authorities.

d. It seems that the programmes drawn up so far have not been adequate for the real needs. Most frequently the provisions of the schemes fall short of demand. And the increased demand for housing which may be expected from the rise in the standard of living is often overlooked.

e. Surveys prior to official building programmes have sometimes proved decisive as to the directions such projects have taken. Proposals resulting from surveys have concerned the location of residential quarters (e.g. in relation to places of work), the way in which the quarters are to be used, etc.

f. The quality of housing is also one of the major preoccupations of regional plans.

g. The present tendency is to spread the building plans over periods of 15 to 20 years.

h. The programmes drawn up have served as a framework for activity involved in the construction of dwellings within the regional plan and have guided the public activity. This is also true of their direction of a search for necessary building land.

i. Several systems for developing new residential zones have been used. Among these are re-development on the spot, expansion or creation of new zones, etc... according to whether the regional plan aimed at slum clearance, transfer of populations to less populated zones or the encouragement of industry.

Nørby, V. Housing problems in the regional planning --2

3. During the Congress the following questions, among others, were discussed with delegates from several countries participating.

a. Role of the public authorities. There was unanimity regarding the need for the intervention of public authorities in the solution of housing problems, as a large proportion of the working class populations have not sufficient means to procure decent accomodation; the action by the public authorities could be extended to the middle and the rural populations as well.

b. Assessment of needs. It was considered apparent that the housing demand is directly related to the standard of living; therefore housing programmes should be drawn up on the basis not only of existing needs, but also with a view to those which will arise from improvement in general welfare. Furthermore, the evolution of the structure of the family and female employment should also be considered.

c. Development of industry and real estate. In various countries, specific solutions have been found for these questions, which have been examined and treated particularly with a view to reviving economic activity in depressed areas or decentralizing industry in congested areas. The general principle revealed by the discussion of this point is the desire to inter-relate housing location and industrialization in order to minimize periodic migrations.

d. Technical progress. Emphasis was laid on the prefabrication and standardization of the various component units used in the construction of a dwelling; the wish was also expressed that there should be an exchange of information between different countries and regions on building methods. These various methods would be likely to reduce costs and to improve the quality of the dwellings.

e. Land policy. There was general insistance that the building programmes should be accompanied by measures for freeing the ground required for the execution of these programmes. These measures could take the form of taxes on the increase of value of certain pieces of land situated on the outskirts of towns or legislation authorizing expropriation. The latter method seems preferable because it is more rapid and more likely to prevent speculation in land.

Moreover, it would be better for the land not to be sold to builders in the future, but rented on the condition that it would return to the community when the building ceased to be utilizable. This is the Swedish system.

f. Green spaces. It was regretted that only too frequently such open spaces were sacrificed to building needs. The wish was expressed that development plans should provide for the creation and protection of adequate green or open zones.

D.E.H.O.

United Nations, Economic Commission for Asia and the Far East, Secretariat
HOUSING IN RELATION TO REGIONAL DEVELOPMENT IN ASIA AND THE FAR EAST
Working Paper No. 25: E/CN.11/RP/L.10, 17 June 1958.
728 : 711.58 (5)

1. This working paper was prepared by the ECAFE Secretariat for the United Nations Seminar on Regional Planning, held 28 July to 8 August, 1958 in Tokyo, Japan. The seminar was organized by the United Nations Technical Assistance Administration, ECAFE, and the Bureau of Social Affairs in co-operation with the UNESCO and the Government of Japan.

2. The problem of housing in the countries of Asia and the Far East varies according to:

a. Metropolitan areas and urban industrial centres,
b. Areas for development of new resources, and
c. Areas for rural development programmes.

Metropolitan Areas and Urban Industrial Centres.

3. Increase in population since 1920 in urban areas has been at a much faster rate than the general increase in population of the countries of the region. This has been due to industrialization, movement of refugees and similar causes. Provision of housing, owing to various social, technical and economic factors, has not kept pace with the population increase; and in spite of efforts by governments, the actual position of housing for low income groups has deteriorated. To prevent further worsening of the housing conditions in urban areas, a well conceived regional plan providing for preventive and remedial measures will be necessary. The preventive measures should include:

a. A ban on new large-scale industries in urban areas;

b. For smaller towns and villages -- an increase in the social amenities and educational facilities, the provision of water supply and sanitary conveniences and the improvement of employment opportunities; and

c. The encouragement of the establishemnt of new towns for big industries.

The most effective remedial measure would be to build, as soon as possible, the maximum number of houses in or near the congested towns.

4. It is necessary to provide these houses on the basis of a master plan, as is done in Singapore, Tokyo, New Delhi, Hong Kong and other metropolitan areas in the region. Governments must give high priority to over-all planning and providing the services such as water supply, drainage, transport, and community facilities such as schools, dispensaries, and recreation centres. The private sector can then be encouraged to shoulder the responsibility of constructing houses, especially for those able to pay an economic rent. This can be achieved by:

a. Providing developed land for construction of houses on a no-profit-no loss basis;

b. Making capital available on reasonable terms through financial institutions;

c. Ensuring an adequate supply of building materials; and

d. Providing construction organizations which can build houses for those unable to do this themselves.
Subsidized housing for the lower income groups should be a government responsibility.

Areas for Development of New Resources.

5. There has been an unprecedented advance in the countries of Asia and the Far East in the development of natural resources since the Second World War. The increase in the production indices since 1948 has been three- to four-fold in many basic items. But there is a need for regional planning to control haphazard growth, and to co-ordinate employment, transport, housing and community facilities.

6. It is recognized that housing is necessary for balanced social and economic development and has to be tackled simultaneously with the development of the region's resources. This is generally done in the high capital/labor ratio industries where the cost of housing may be only 3 to 5 per cent of the total investment. It is lagging behind, however, in the case of small undertakings with a low capital/labor ratio and of land reclamation schemes where the cost of housing may be as high as 25 to 30 per cent of the total investment. It also becomes difficult to provide houses in development schemes where the propect of steady long-range occupation is uncertain.

Areas for Rural Development Programmes.

7. The problem of rural housing is vast, and as yet it has not received the same attention as have housing problems in other kinds of areas. The existing villages are overcrowded and congested. The houses are dilapidated and built with flimsy materials. In most cases, therefore, a new layout of a village has to be prepared and the houses have to be reconstructed. A central authority has to be set up to form policy, and regional authorities must be ready to initiate and co-ordinate housing schemes and organize training of technical personnel. A useful beginning can be made by initiating pilot projects with a village as a unit to gain experience in this new type of work and overcome the psychological resistance to such a comprehensive approach. The whole housing program should be in keeping with the general growth of the economy and the level of other social services in the rural areas. In this way unduly heavy financial burdens on village people can be avoided.

Conclusions.

8. a. The housing problem is complex and must be tackled as an integral part of the development of a region. Each country should therefore have a special housing and town and country planning department or organization.

b. Preventive as well as remedial measures should be taken to deal with the present serious housing problems in urban areas.

c. The private sector should be encouraged to construct the maximum number of housing. Encouragement would include the providing of developed land, loan finance and building materials at reasonable rates.

United Nations, ECAFE Secretriat. Housing in relation to regional planning... -3

d. Housing should be considered simultaneously with any new development schemes, and the standards should be in keeping with the existing economic and social conditions of the area.

d. Adequate administrative and technical machinery should be created at central and regional levels for the planning, programming and implementation of large rural housing programmes. To gain experience, a beginning could be made by starting a few pilot projects taking the village as a unit.

APPENDIX 1: Date Regarding Increase in Urban and Total Population Since 1921 in Burma, Ceylon, India, Japan and Pakistan

(COUNTRY) (Year)	Total Population		Urban Population	
	Number	Rate of Growth per 1000 per year	Number	Rate of Growth per 1000 per year
BURMA				
1921	13,212,192	-	1,285,673	-
1953	19,045,000	11.9	2,595,586	27.1
CEYLON				
1931	5,306,871	-	737,272	-
1953	8,098,673	28.4	1,239,133	27.9
INDIA				
1921	248,120,746	-	28,825,245	-
1951	356,879,394	12.6	59,851,704	30.4
JAPAN				
1920	55,391,481	-	10,020,038	-
1950	83,200,000	13.9	31,203,000	12.9
PAKISTAN				
1921	54,363,875	-	2,835,600	-
1951	75,842,165	7.7	7,869,000	35.5

Note: Definitions of "urban population" are slightly variable; in all countries except Ceylon and Japan, all communities of more than 5,000 population are included. In Ceylon all Municipal and Urban Council Areas are included, and in Japan the critical figure is 20,000 population.

PLANNING

I.O.Q.

Ali, M. Ahmed
URBAN PLANNING IN PAKISTAN
Journal of the Town Planning Institute, July-August, 1958. pp. 214-216
711.4 (549)

Background

1. The population of Pakistan in 1951 was 75.9 millions, of which 42.1 million lived in the East "Wing" and 33.8 million in the West. The respective areas are 55,000 sq mi. and 310,000 sq. mi.--making for a density of 109 persons per sq. mi. in the West and 777 in East Pakistan. And superimposed on these contrasting densities are climatic factors. Pakistan is a tropical monsoon climatic region with alluvial soil, ever green with vegetation and having an average of 88" of rainfall annually. West Pakistan, on the other hand, is semi-arid with much desert land, and having only an average of 12" of rainfall. This areas has, however, one major alluvial soil zone, the basin of the River Indus and its tributaries. These rivers have, to a considerable extent, been brought under control for irrigation under an extensive system of dams, barrages and canals. This system is the biggest irrigation network on earth and makes up some 22 million acres of land.

2. Both of the wings have an agrarian economy, with about 60% of the national income derived from agriculture; but there are sharp differences between the East and the West in this regard also. In urbanization too there is a contrast, with about 4.5% of the population in the East living in cities and some 17.7% in the West urbanized. But urbanization is rapid in both wings. A further complication has been the influx of 8 million refugees into Pakistan, mainly into the urban areas, between 1947-51. Karachi, the capital, has borne the brunt of this immigration and has risen from a population of 300,000 in 1947 to 1,120,000 in 1951. The result has been a vast unauthorized mushroom growth of hutments or 'bustees' in and around the City of Karachi and other major cities of the country. Today Karachi's population stands at 1.6 million; and in spite of the fact that about 40,000 families (200,000 people) have been settled in the suburbs in small, single storeyed units, some 60,000 families or 300,000 people must be rehoused.

3. "These problems have been much more severe in Pakistan than in India, which had rather fewer refugees and twelve times as many urban centres in which to distribute them." In Pakistan also the birth rate (34/1000) and the death rate (24/1000) have resulted in a natural increase of 10/1000. The bulk of this natural increase has been among the urban population. The entire pressure of population growth is on the existing towns, with the result that these communities are now experiencing the pangs of over-crowding and congestion, with shortages of all amenities from drinking water to schools. There is therefore a great need for both urban and regional planning in Pakistan. But so far no policy on the planned dispersal and distribution of the population has been accepted, and no major decisions have been taken regarding new towns and new centres. (Although many "paper" plans have been made by consultants. Ed.)

Legislation

4. Two main kinds of legislation have comprised planning legislation in Pakistan: the typical old-established Improvement Trust Act and the so-called Town Planning Act. The Improvement Trust Act provides for the creation and administration of the Improvement Trusts, which are designed to supplement the work of the municipalities. The Trust has powers to undertake slum clearance,

general improvement, rehousing, road widening and other such activities within the community for which it is set up. A Master Plan is not a prerequisite for the operation of an Improvement Trust, and no provisions exist in the Trust Act for zoning, sub-division regulation, town planning control or administration. Except for the lack of reinforcement by the Act, the Improvement Trust is felt to be very suitable as a Town Planning Authority. The second body of planning legislation has been called the Town Planning Act, but it is nothing more than enabling legislation to give the local authorities, such as the municipalities, certain powers to prepare schemes for future expansion and improvement. This is felt to be very backward in comparison to other countries' legislation.

5. There have been several encouraging changes in legislation recently. The first of these was the Dacca Improvement Trust Act in which one function of the Trust is to prepare and administer a major road and zonal plan--amounting to a Master Plan. Some additional clauses have been added to this Act to give the Trust several effective powers of town-planning control. A more substantial improvement is the Karachi Development Authority Order of 1957, which creates a semi-autonomous body to be run by a Board of seven members appointed by the Government. Karachi's Improvement Trust, Water Board and Refugee Housing Department have all been merged into this new Authority. With a sphere of activity spreading over the entire 440 sq. mi. Federal Area of Karachi, the Authority's general functions are:

Bulk water supply;
Trunk sewer disposal system;
Public housing for refugees and others;
Town planning, development of new townships, and slum redevelopment;
Building of new roads and where necessary the widening of existing ones;
Issuance of all building permits, planning permissions, checking and control.

The Authority has been functioning for only a few months. It intends soon to bring forward new regulations to reinforce town-planning control and administration; and subdivision regulations will be among these.

The Greater Karachi Plan

6. A Master Plan for Karachi was prepared by Merz, Rendal and Vatten in 1952. The population planned for is 3 million, 2/3 of which will be distributed in the suburbs. The suburbs consist of neighbourhood units, each unit having 1,200 acres, accommodating a population of 40,000 to 50,000 and a 100 acre industrial belt. The industrial belts of the several suburbs are connected by a railway system, and the neighbourhood units are linked together and connected to the center city by radiating expressways--most of which also serve as rapid transit routes. In the form of an outstretched hand, there are seven 'strings' or 'fingers' of neighbourhood units. Each string is an administrative District and is to have its District Centre (commercial and civic) for its 300,000 inhabitants. Between the strings are greenbelts reaching into the city along natural features such as rivers and hills. For the existing central city an outline of transportation, including major roads, overhead and underground expressways and rail rapid transit has been suggested. The Master Plan shows about a dozen 'cloverleaf' and 'trumpet' intersections and another dozen grade-separating 'fly-overs.'

Ali, M. Ahmed. Urban Planning in Pakistan --3

7. The actual development of Karachi has taken a slightly different shape than that envisioned in the Master Plan. The requirements of the city itself, the geographical features and economics are dictating many changes in the plan. One of these has been the grouping of the industries into estates of 600 acres. But the reservations for all the new major roads are being maintained. In this case the Master Plan has been of great service in allowing the coordination of all lines of communications and utilities in the expansion of the city. With amendments, the plan is being brought up to date, and it is expected that it will soon be adopted and published.

The Outlook for Planning in Pakistan

8. It is felt that the general outlook is quite bright. There is a Housing and Town Planning Section in the National Planning Board which has already provided in the First Five Year Plan large sums of money for the development of satelite towns and the improvement of existing ones. Another recommendation of the Section has been for the creation of Housing and Town Planning Departments, one in each Wing. In East Pakistan, this recommendation has already been acted upon, and a Department has been established. West Pakistan now has a Town Planning and Architecture Division under the Public Works Department, which the Section has recommended set apart as a Department. The next step would be the enlarging of the two Town Planning Departments as ministries at the provincial levels. The responsibility of such departments or monistries would be to regulate, encourage and organize, as necessary, the urban planning and housing programmes. Each would maintain a qualified staff of town planners, architects, and engineers.

9. The serious dearth of qualified town planners has been Pakistan's biggest problem. There are so few that there is not any association or institute representing town planners, but steps are being taken to form initially a Planning Officials' Association to include also architects, engineers and others actually engaged in planning. One of the recommendation of the Planning Board - two schools of Architecture and Planning - are now being set up, one in Lahore and the other in Dacca, with the assistance of the United Nations Aid Programme.

A.B.N.O.

Blumenfeld, Hans
COMMENTS AND SUGGESTIONS FOR A SCHOOL OF REGIONAL PLANNING
Memorandum to Candido Oliveras, Chairman of Puerto Rico Planning Board
August 2, 1958.
378.9 : 728 (100)

1. Holding that planning cannot be adequately done by professional "planners" and that planners cannot be adequately trained by schools, Hans Blumenfeld has added his own thinking to that of Kayanan and Solow regarding the shape the proposed planning school in Puerto Rico should take. For EKISTICS, we have tried to asbtract his thinking with a view to its possible application to the proposals for planning schools in other parts of the world. Hans Blumenfeld, one of the most original-minded of American planners, is Assistant Commissioner of Planning Metropolitan Toronto Planning Board. (For another article by Mr. Blumenfeld, see HIB-GA 25, pp. 30-31).

2. "Planning" is an inherent part of any human activity. Strictly speaking, there is no such thing as a "planner" per se, any more than there is a "doer" or "executive" per se. The professional planner can function successfully only in a society where the professional "doer" has a planning approach. (Such an approach has been well defined by Patrick Geddes as "synoptic," as the ability and willingness to see each phenomenon and action in its wider inter-relations in space and time.) On the other hand, professionals from many fields can effectively work in planning organizations, provided they have a planning approach.

Education in the Planning Approach

3. Professions which should receive some education in planning problems and methods may be roughly grouped as follows:

Government: public administration, political science, law
Economic: economics, business, real estate, geography
Social: sociology, mass media, education
Technical: architects, engineers

In all these fields, planning teaching in Puerto Rico should be addressed to two different groups, requiring different methods. First to university students, in the form of regular courses, lectures and seminars. Second to practicing professionals in the form of evening courses and of short, intensive "institutes" or seminars on specific problems. (Some of the second group might be participants from outside the country).

4. For both of these two groups the planning courses would be directed toward two goals: First, to enable these present and future practitioners of other professions to use effectively the planning approach in their work and to co-operate productively with professional planners; and second, to recruit suitable individuals into professional planning work.

Planning and the Planner

5. It is widely accepted that planning work must be carried out by a team of persons recruited from different professions: economists, sociologists, geographers, architects, engineers, etc. In this team the professional planner often finds himself in the role of the universal dilettante. In dealing with specific problems, he finds that he knows less about them than his team-mates who have been trained in the related specific professions. His only specialty is his generality, his ability to see how changes in one field affect and are affected by changes in all other fields.

6. The role of the professional planner as a universal dilettante creates the familiar dilemma of the universal curriculum, which Dean Hudnut of Harvard once illustrated by enumerating all the fields of knowledge which are indispensable for a planner and then adding up the time required for the corresponding courses to a total of 92 years. Similarly, the acquisition of thorough knowledge of all the fields included in a planning curriculum might require two centuries, rather than two years. It is impossible for a student to learn in one or two years to be a planner, What he can and should learn is how to become a planner. While it is desirable to make the student aware of as many as possible of the "great variety of subjects" suggested for inclusion in a curriculum of limited duration, this may not be indispensable -- provided that the student leaves the school equipped with the ability and the mental attitude to explore ever new subjects throughout his lifetime.

Suggested Curriculum of the Planning School

7. This implies an emphasis on method rather than on content. Following Prof. Kayanan's earlier suggested main headings for the planning curriculum, suggested emphasis for each is:

a. Social Science: Methods of research and statistics. These would be developed in application to planning problems, but thoroughout method would receive precedence over attempts to cover a wide variety of subjects.

b. Planning Theory and Philosophy: Here the emphasis should be on the historical development of human settlement. Perhaps the most important, and probably the most difficult attitude which a planner must develop is an understanding of the constant change occurring in every city and region and of permanance through change.

c. Physical Planning and Desigs: Here the emphasis should be on developing the ability to think in three dimensions. As student designs cannot be translated into reality, they should be supplemented by making students re-translate an existing environment into those graphic tools -- maps, profiles, etc. -- which the planner uses to create or change the physical environment.

d. Planning Practice and Seminars: This would call primarily for the "workshop method". Here the cooperation of planning authorities would be of particular value. Again, depth should receive precedence over breadth. If the student learns to deal with all aspects of one or two projects, even small ones, these should be no great concern if he learns nothing about, say, parking or slum clearance. He can pick that up later in this working life.

Kinds of Students and their Needs

8. Five groups of 'clienteles' of students should be served by the Puerto Rico planning school, and two main groups of these may be distinguished:

a. Resident of the country in which the school is located. The first responsibility of the School should be education for planning in the home country, and three kinds of students would be enrolled toward this:

Blumenfeld, H. Comments and suggestions for a school of regional planning --3

(1) Full-time students, to be trained as professional planners

(2) University students in other professions, to receive planning orientation.

(3) Practitioners in other professions, to develop planning orientation.

b. Resident of other countries (eg. mainly Latin America) While the educational needs of resident students might alone justify the establishment of a Planning School, the School could be further developed and its value greatly enhanced if it can also serve students from other nations and areas. Solow has earlier made helpful suggestions along this line for Puerto Rico. Visiting students would consist of two groups:

(1) Full-time students to be trained as professional planners.

(2) Practitioners in other professions to develop planning orientation.

9. The main problem in meeting the needs of these 'clienteles' of students will be that of reconciling the differing needs of two of the groups of full-time students. Most of the home-country students should complete a two-year course leading to a Master's degree. Some of the foreign students might also complete this course; but most of them, and some of the local students as well, may find it impossible to devote more than one year to post-graduate study. It will hardly be possible to run two parallel programs, one for one-year and one for two-year students. A program must be devised which gives a rounded education, leading to a certificate in one year; and a program for a second year which avoids duplication of the first year's work.

10. It is believed that the four-point program sketched above, with emphasis on method rather than on substantive knowledge, could provide a core planning education in one year. The second-year program would follow the same basic structure, but would apply the core methods to a wider range of substantive materials. It would also provide for study of national (and local) law, political structure and public administration. It is to be noted that the one-year program made no provision for teaching public administration. Because of the great difference in institutional structure by countries, it is felt that students from other countries should study this field in their homelands after graduation, either through evening courses or through a combination of reading and practical experience. Local students who leave the Planning School after the first year would have to supplement their education by the same methods.

11. The program developed here can be justified only if the proposed school has a unique orientation. It could not be "just another planning school." The orientation for a Puerto Rican Planning School is seen as clearly indicated by the achievements of the Government of Puerto Rico in regional development planning--thus a School of Regional Development Planning. The vague term "regional" is chosen deliberately to denote planning for regions within a country (such as Puerto Rico) or for areas encompassing several countries (such as the Central American Isthmus or the Amazon Valley.)

12. It should be recognized that such an orientation might not fully satisfy the desire to integrate civic design with development planning. The former would receive less emphasis than is indicated by the suggested curriculum. It is felt that we must recognize the need for two separate (though closely related and partially overlapping) specialties in the planning field, each of which requires a different kind of education: Social-economic development planning and Physical-design planning.

13. Since it is understood that the establishment of a School of Architecture at the University of Puerto Rico is under consideration, it is suggested that it might be worth considering a modification of this proposal toward establishment of a School of Civic Design which would deal with landscape architecture and urban design as well as with architecture. Conceivably such a school, or devision of regional development planning in a "School of Town and Regional Development Planning."

14. Mr. Solow has earlier suggested that the School should also be a center of research and documentation in its field. This function might be instutionalized as a separate, associated entity under the name of an "Institute for Regional Development Studies." The institute might carry out studies for the operating agencies of Puerto Rico and possibly for other countries.

15. The rather ambitious program presented could be developed only gradually. The minimum personnel requirements for a start would be: a full-time head of the school or division; at least one full-time assistant professor who should be a citizen of the home-country, two laboratory assistants and one secretary. Only experience can show how far the school can develop by drawing on the staff of the University and the operating agencies of the Government and on visiting lecturers, and how far and in which fields it will have to increase its full-time staff.

B.D.O.

Richards, Audrey I.
PROBLEMS OF URBANIZATION AND COMMUNITY DEVELOPMENT IN CHANGING SOCIETIES.
Town and Country Planning Summer School (Overseas Section), Bangor, England.
August, 1958.
325.33 (66 - 67 - 68)

1. This paper was given by Dr. Richards, an anthropologist, from Newnham College, Cambridge, as a broad outline of the social aspects of urbanisation. It was followed by more specialized talks by experts in the fields of housing and town planning at the Summer School.

2. REGIONAL SCOPE. Because first hand information was more readily available, the scope of the paper was limited to urbanization in East, Central and South Africa. These are areas where town life is not traditional, as it is in the coastal areas of West Africa, and where urban areas have been mainly developed by European initiative. It is felt that most of the types of community with which the town-planner in underdeveloped areas has to deal are well represented in these areas--with certain other features found in South Africa. The kinds of communities include:

a. Mushroom settlements with, or on the borders of, the new industrial towns: the "shanty towns" of grass, petrol tins and sacking which have appeared from time to time in the Union and occur also in the copper belt of Northern Rhodesia, in Kenya, Tanganyika and in or near Kampala and Jinja in Uganda. These are unregulated as to building or composition in the first instance, overcrowed, unsanitary and mainly populated by new comers to urban life, who are almost always Africans of mixed tribal composition who are lowly-paid and constantly moving.

b. Housing schemes of industrial and commercial concerns, such as the mining compounds of the Union and the Federation and the housing schemes or large European or Asian-owned estates in Kenya, Uganda and Tanganyika. These are European built and controlled, designed according to western concepts of hygiene, sometimes reaching a high standards in this respect. The population is always indigenous, and the inhabitants strictly regulated, sometimes limited to one sex as in the case of the Rand mines.

c. Government and municipal housing, usually following in the wake of industrial development to provide housing for African, Asian, and-more rarely-for lower paid European employees of the Government and the Municipality, for domestic servants and small traders. These are often built to replace "shanty towns." Such housing is usually European built, though experiments in providing plots for Africans to build their own houses to Government specification have been made. Their population is regulated but they provide more possibilities for the development of family life, (houses varying according to the tenants' income) and for permanent occupation.

d. New African housing experiments mainly limited to areas such as Buganda where Africans have individual titles to land and may be building high cost housing for rental.

Richards, A I. Problems of urbanization and community development... --2

e. The urban spill-over in sub-urban or peri-urban areas outside township borders where Africans congregate, often at a high densities, in order to get the advantages of industrial and commercial openings with the advantages of cheaper living and freedom from European control.

f. Planned settlements in rural areas, which are few in number at present. But it is impossible to consider urban housing without a knowledge of the settlement patterns of villages from which urban dwellers come and to which many still return, and housing standards from the towns are being introduced into the rural areas.

3. MAJOR DIFFICULTIES The following grouping of the special difficulties of organising community life in these parts of Africa were given.

a. Unfamiliarity with town life. Unlike the inhabitants of coastal areas of West Africa, those of East and Central Africa are generally unused to urban life or even to life in large villages. (Typical settlements in Northeastern Rhodesia vary from 10-50 huts, with the inhabitants closely related to the headman.) For several reasons, local groupings of this type are particularly ill-adapted to urban conditions.

(1) The formation of kinship units may be prevented by the methods used for allocating housing in European controlled communities. Or the size of the houses provided may make it difficult to assemble important relatives or even to allow for the continued residence of adolescent children.

(2) Leadership based on age and descent is no longer suited to urban conditions. New leadership based on wealth or occupation may appear in the older African townships, but is unlikely to do so in the new.

(3) Small village morals and notions of neighbourliness are unsuited to town live (hospitality practices, mutual help, shared responsibility for cleanliness etc.) The sanctions of public opinion are ineffective supports for morality in new, amorphous and heterogenous communities.

(4) Traditional knowledge of house craft and child care may be unsuited to urban housing and this is in any case acquired by the observation of older women, who are not usually present in towns.

b. Racial and tribal admixture in towns. All South African towns are based on racial zoning (European, Asian, African, Coloured) and most East and Central ones are too. African communities are characterised by the large number of separate tribal groups they contain. (Kisenyi, a slum areas of Kampala, had 40 tribal groups in 1953, while Luansha had 72). Distinctions between the larger language groups, as for instance between Nilotics and Bantu in Uganda and Kenya, may be as marked as those between French and German. Marriage institutions may differ, making inter-tribal marriages a source of conflict (e.g. the position of the patrilineal Ngoni and the matrilineal Bemba on the copper belt of Northern Rhodesia). Ideas of leadership may also differ,

Richards, A.I. Problems of urbanization and community development... --3

as well as the staple diet, housing and hospitality customs.

In African-organised communities, such as mushroom settlements on African owned land, the grouping of houses tends to follow tribal lines, producing either separate settlements with their own leaders, as in the case of some occupational groups (e.g. Haya charcoal burners or Luo bakers in Kampala and Alur communities at the Owens Falls dam), or else congeries of houses, roughly contiguous and containing members of the same kinship group. In European-run townships or industrial compounds the mixture of tribal elements may be complete.

Tribal zoning has the following tendencies:

(1) to perpetuate tribal divisions;
(2) to make the allocation of housing very difficult;
(3) to make for faction fights.

Tribal admixture makes for:
(1) suspicion, tension and accusations of witchcraft;
(2) retardation in the formation of community sentiment or local leadership.

c. Constantly changing population--due to people's own wishes.

(1) Migratory workers, e.g. men coming to town to get money to spend in rural areas for seasonal work, or for two to three year periods; men semi-permanently in urban areas but going back for long holidays to tribal areas; women coming to look for husbands, to visit husbands and relatives etc;

(2) Children coming to town to look for better schooling and drifting in and out of jobs;

(3) Newcomers to town changing employment constantly;

(4) Rise in the standard of living, causing men to look for better housing;

(5) The desire of older residents for freedom to expand and build houses of the type they want and to settle relatives near them, resulting in a small but steady stream of older men returning to rural areas in order to live as they please.

The movement of people is therefore composed of men and women experimenting in urban life with a return drift to the country of those unable to adapt themselves or those wanting a higher standard of living and housing than the present urban arrangements make possible. (Figures from Kisenyi, Kampala showed that only 20 per cent of the men in the survey sample paid tax two years running in the same place). Further research is needed.

d. Rapid changes in the standard of housing desired in a situation in which the difference between the housing for the highest income group (Europeans) and the lowest (casual African labourers) is so large as to make a constant challenge. Housing thought suitable by rural Africans one year may be thought well below standard of living in ten years time. Housing remains the most important index of standard of living in most African towns.

Richards, A.I. Problems of urbanization and community development... --4

e. Administration of housing schemes by persons of a different culture from that of the tenants. Housing schemes in Government or industrial townships or compounds have inevitably been managed by Europeans whose knowledge of African family patterns have been limited and whose major aims have been different. Europeans tend to put hygiene and order first; African, possibilities for family life, security and status. Channels for consultation are difficult to set up in a heterogeneous population.

H.O.

United Nations, TAA, ECAFE, and Bureau of Social Affairs
REPORT OF THE TOKYO REGIONAL PLANNING SEMINAR
Conference Document No. 31, 8 August 1958.
061.3 : 711.2 (100)

Introduction

1. The Seminar on Regional Planning was a follow-up of the Seminar on urbanization organized by the United Nations in Bangkok, August 1956. The purpose of the Tokyo seminar was to consider: The trends and methods of physical planning in countries of the ECAFE region and its place in the total process of economic and social development in these countries; the criteria and factors determining the character and extent of the region for planning purposes; and case studies on current positions, practices and results of physical planning at the local, regional and national levels.

2. Participants from 16 countries and from the ILO, WHO, UNESCO, and representatives from non-governmental organizations attended the Seminar. There were in all 98 participants and observers. Host facilities to the Seminar were provided by the Government of Japan. Mr. Kisaakira Kano (Japan) was elected chairman of the Seminar; and Senator P. Madrigal Gonzalez (Philippines) and Mr. K. Vyasulu (India) were vice-chairmen. The working sessions of the Seminar were chaired by Mr. Kano, Mr. Malai Huvanandana (Thailand), Senator Gonzalez and Mr. Vyasulu. The following specialists assisted the Seminar: C. Abrams (Legislation, Land use), N. Ginsburg (Scale of planning), R. Glass (Social aspects, evaluation), M. Honjo (Housing and ecommunity planning), A.C. Kayanan (Training for planning), M. Meyerson (Methodology, Transport and communications), H.M. Philipps (Community development education), J.H. Scheuer (Community facilities and services), J.P. Thijsse (Environmental aspects of planning), P. Vernon (Economic aspects of planning, financing), P. Ylvisaker (Administrative aspects of planning), Y. Sakurai (Labour), O. Weerasinghe (Technical assistance) and Dr. F.J. Dy (Public Health and sanitation). The following topics were discussed during the seminar.

Current Trends Influencing Regional Planning

3. Chairman was Kisaakira Kano, with P. Hauser, Saw Tun, V. Prasad and P. Ylvisaker acting as discussion leaders; and L. Rodwin was rapporteur.

4. Following are the conclusions arrived at on this topic.

a. Economic factors

(1) The basic policy for regional planning should be to help develop, assemble and allocate national resources to provide maximum economic and social returns. (Reference to ECOSOC regarding balanced economic and social development)

(2) In accomodating the huge migration of population to urban areas, development should be so organized as to be sufficient to meet the needs of metropolitan populations, and in so doing it should pay special attention to the cost of overhead capital with a view to reduction where feasible and consistent with the social goals of the country.

(3) More regional economic studies are required to provide a sound foundation for regional development programmes and to aid in the creation of adequate employment opportunities.

(4) More attention should be devoted to the agricultural problems of regional planning and to the need for arresting the growing discrepancy between conditions of living in village and urban areas.

4 -b. Social factors

(1) The vast increase of urban populations in developing areas is likely to aggravate the already existing social problems.

(2) Population growth as such is only one of the factors which demand integration of the many different aspects and policies at the different stages and levels of the planning process.

(3) It is by no means easy to ensure that social policies directly expressed in the fields of education and public health, for example, and indirectly expressed in economic, land-use and administrative arrangements, are compatible.

(4) On the whole, the results of social investment are often longer delayed than those of economic investment, and they are also less tangible. They can thus not be easily synchronized, and moreover their consequences are by no means unambiguous.

(5) Radical social changes of the kind required in many of the countries of the ECAFE region are bound to be harsh in many respects. Such transitions should be studied so that growing pains can be minimized.

4 -c. Physical factors

(1) The objectives of physical planning should include a more efficient and a more desirable organization of interdependent land uses including agriculture, water resources, industry, power, trade, transport and communication, housing and community services and facilities, etc.

(2) To discharge this responsibility, physical planners must participate in the formulation of national development policies alongside with the economic, social and administrative planners to ensure that adequate account will be taken of the physical alternatives and consequences of those policies.

4 -d. Administrative factors

(1) More effective communication and coordination is essential among planners and the people concerned.

(2) Equally essential are flexibility, openness to experimentation, adaption to specific circumstances, and encouragement of creative energy.

(3) Many countries would benefit from a clearer formulation of their national policy and programmes for regional development of the mechanism for execution of this policy.

(4) One of the problems of launching and implementing planning programmes in all countries is that of trained manpower to keep pace with programmes of development. The difficulties of training and recruiting trained planning staff is one of the shortages to be met.

(5) Regional breakdowns of capital budgets might sometimes provide a useful mechanism for ascertaining whether the complementary requirements of development programmes in each region have been satisfied.

4 -e. Staging and priorities

(1) Basic to all regional development programmes is the location, scale and set of priorities.

(2) Village, metropolitan and resource development programmes require a more broad guaged approach which will take into account agricultural, economic, sociological, physical and administrative facets of the problems and the new technological potentials for the location of industry and distribution of population.

(3) Applied research programmes are needed to examine and record relevant experience and to solve problems before they become serious.

(4) Realistic economic, social and physical plans can and should be used to help provide guidance for capital budgeting decisions.

Applications of Regional Planning Techniques to Metropolitan Areas.

5. Malai Huvanandana of Thailand was chairman of this group, while E. Isomura was discussion leader and P. Hauser was Rapporteur. Conclusions reached were as follows:

a. Economic factors

(1) Metropolitan regional planning in the economically underdeveloped areas must be conducted with the recognition that the basic national problem is one of low product per capita.

(2) Planning must contribute to national aspirations to increase product per capita and levels of living and must avoid serious diseconomies of lesser goals.

(3) For this purpose a better knowledge of the economic functions of the metropolis is needed to enable the planner to take full advantage of the metropolitan agglomeration as a pool of resources, as a point of external economies of scale, and as a medium through which effective communication is achieved for economic growth.

b. Social factors

(1) Metropolitan regional planning must necessarily focus on the severe social problems rising from metropolitanism as a way of life and especially as a by-product of the frictions of rapid urbanization.

(2) In planning the amelioration of social problems, care must be taken, however, in the allocation of limited resources to achieve proper balance between "economic" and "social" investment.

(3) In so doing, the long-run objectives of increasing product per capita and achieving social gains should not be unduly sacrificed for short-run gains.

United Nations... Report of the Tokyo regional planning seminar --4

5 -c. Physical factors

(1) Environmental planning must be achieved in the context of and in relation to economic and social planning.

(2) It is especially important that planning of the physical environment be aimed at facilitating and accelerating economic growth.

(3) It may be necessary to compromise with desired objectives in the short run to achieve longer-run social and economic aims.

5 -d. Administrative factors

(1) Metropolitan regional planning must be organized in a manner to operate smoothly in relation to national planning including rural regional planning, on the one hand, and local planning including self-help and community development programmes, on the other.

(2) The administration of planning programmes should permit maximum participation by non-governmental agencies and the population concerned.

(3) Special attention should be given to the utilization of techniques and processes that can be most effective in the given national and regional situation.

5 -e. Staging and priorities

(1) Planning must be as realistic as possible in achieving balance between immediate and long-run goals.

(2) Realism can be achieved by the proper phasing of development in a series of steps leading towards ultimate goals, and priorities must be allocated among specific programmes so as to achieve balanced economic and social development.

(3) Effective staging in metropolitan regional planning will prevent complacency with half-way measures, as well as the ultimate disillusionment if short-run goals are set too high.

Application of Regional Planning Techniques to Rural Development Programmes

6. Senator Gonzalez of the Philippines was chairman of this group, K. Hadinoto was discussion leader and C.H. Concio was rapporteur. Conclusions reached were:

a. Economic factors

(1) The purpose of economic planning in rural development programmes is to increase the welfare of rural areas through greater efficiency of production and reorganization of means of production. Among the elements which demand particular attention are the guarantee of land tenure, the control or rents, the provision of rural credit facilities and the improvement of transportation facilities and communications. A special aspect of planning for rural development is found in countries where the migration of large numbers of debt-ridden tenant farmers has been encouraged into areas previously undeveloped. Another problem in ECAFE is seasonal unemployment, partly due to unsolved agricultural problems.

United Nations... Report of the Tokyo regional planning seminar --5

(2) Alternative sources of livelihood outside of agriculture must be provided for the rural populations. This would mean the encouragement of cottage industries or the establishment of light industries in rural areas which could utilize part-time labour from the surrounding farmlands and which would provide additional cash income, making the peasant less dependent on available rural credit facilities and giving him an economic freedom which thus far has been unattainable.

6 -b. Social factors

(1) The objectives of social planning in rural development schemes is to provide the rural dweller with the complex of amenities now lacking, such as suitable housing comparable to that associated with urban areas. In this way he will be provided with incentives for increasing the efficiency of his economic activities.

(2) Attack on illiteracy and the provision of education facilities and community development will be important to create in the farmer an increasing self-awareness of his problems and to encourage a psychology sympathetic toward self-help.

(3) It is extremely important that the social aspects of planning programmes be developed within established cultural frameworks, that changes in customary procedures and in value orientations not be imposed from the outside upon the farmer, and that local needs and aspirations be carefully ascertained and understood and taken into account in organizing the social aspects of planning.

(4) Special attention should be given the training of personnel within the villages to provide them with not only an understanding of local problems, values, aspirations, and difficulties, but also an understanding of planning techniques oriented particularly toward the integration of local requirements with regional and national objectives.

6 -c. Physical factors

(1) Physical planning in connection with rural development requires a thorough resources inventory.

(2) The purpose of physical planning is to rationalize the physical elements in an area, both natural and cultural, which together compose the external economies that make economic advancement possible and which provide the necessary infrastructure of any economic system.

(3) Among the particular elements which must be dealt with by physical planning are:

(a) The control through smaller or medium size irrigation projects and provision of water for irrigation, drainage, and human and animal consumption;

(b) The provision of adequate shelter designed to satisfy local and environmental and cultural conditions;

(c) The provisions of transportation and communication facilities which will tie in individual villages with their nodal market centers and the market centers in turn with the larger cities; and

(d) An increasing rationalization of the patterns of settlement, so as to make more efficient the movements of farmer to field and of produce to market.

(4) Another important aspect of physical planning is the balanced utilization and conversation of natural resources, with due regard for conflicting demands for the resource endowment and a suitable concern for the equilibrium between benefits and costs.

6 -d. Administrative factors

(1) The administration of rural development programmes requires the development of a flexible system of planning regions.

(2) Local government units can act as the basic building stones for such a system and local officials assisted by councils of village elders or councilors can act to coordinate the implementation of rural planning policies.

(3) Since the number of local units is so large in the ECAFE region, a sampling of rural villages is required where rural development programmes should be applied, at least in the initital stages, for use as demonstration centers.

(4) Special administrative regions might also be created as "region for demonstration purposes" so that the lessons learned in the pilot areas could be disseminated systematically throughout the special region. A corollary to this is the desirability of using as many local, but trained, personnel as possible so that a "grass roots" feeling permeates the entire programme.

(5) To be avoided in areas where differences in language dialects are significant is the assignment of field personnel speaking the dialect of a single village or group of villages.

6 -e. Staging and priorities

(1) Given the relatively scarce resources of the ECAFE countries, it is unlikely that all aspects of regional development planning can be implemented at once and in full. Ordinarily, the following apsects of programming need be considered:

(a) Increases in production;

(b) The marketing of surpluses;

(c) The provision of non-agricultural kinds of rural production or employment;

(d) The preparation, training and education of rural populations for economic and cultural change;

United Nations... Report of the Tokyo regional planning seminar --7

(e) The improvement of housing and community facilities and services.

These are interrelated; but, in individual cases, local needs and requirements may provide information by which the categories might be best ordered.

(2) The development of priorities in local rural development planning requires a particular awareness of local problems. If food shortages are endemic, for example, then increases in agricultural productivity clearly are of the highest priority. In others cases, where marketing of surpluses is a particular problem, the provision of transport facilities and cooperative marketing facilities may be of the highest priority.

(3) If the area concerned is on the edge of a great metropolitan area, the transition from a primarily rural to a mixed rural-urban situation can best be made by giving the highest priority to certain kinds of additional training that will prepare the villager for urban occupations.

(4) No dictum can be established for the determination of phasing in the case of rural development, any more than it can be stated for planning in metropolitan areas.

Application of Regional Planning Techniques to the Development of Resources.
7. Chairman was K. Vyasulu, discussion leader was V. Prased, and rapporteur was N. Gunaratna. Conclusions were as follows:

a. Regional resources decisions are being made constantly. Most of the countries in the ECAFE region are now adopting public programmes to plan for these decisions in order to:

(1) Develop underdeveloped resources in such a way that actions for specific purposes can reinforce rather than run counter to each other, and to

(2) Utilize developed resources (and those to be developed) in such a way and as such rates that future as well as present requirements of the particular country can be met.

However, the time span, the geographical scope and the degree of elaboration of the resource plan must always be made with a full appreciation of the rapidity with which relevant conditions can change. Changing technology constantly makes some materials obsolescent and others of enhanced value. Sometimes, technology develops new uses and at other times it produces new means of resource discovery and exploitation. Thus the planner cannot easily foresee and apply an optimum development rate for any given resource. The resource plan, therefore, must never be so rigid in structure, scope and detail as to stifle future responses to change which originate from outside the plan.

b. Among the obstacles to regional planning for resources, especially in the ECAFE countries, are scarcity of critical natural resources, investment capital, data, analytical techniques and trained personnel.

United Nations... Report of the Tokyo regional planning seminar --8

7 -c. Recognizing the above obstacles (obstacles shared to a large degree with the developed countries), the following series of points were recognized:

(1) Regional planning for resources must be aimed to achieve the economic goals of the country.

(2) Substitution of resources should be sought when particular resources are absent or as a way of conserving non-renewal resources for future use. Technological research on resource substitution should be encouraged.

(3) A transportation system must be developed to transfer resources to the points where they will be processed or consumed.

(4) Resources are sometimes utilized in a wasteful manner and more efficient methods of resource utilization should be sought constantly.

(5) Both positive actions (for example, tax incentives or direct public investment in related facilities) and negative actions (for example, land use controls) should be employed.

(6) Staging between short-term and long-term programmes must be achieved. For example, a short-term water development programme may have to precede a long-term water development programme.

(7) Legally, most governments have the inherent public powers to do regional resource planning. But they must face the policy implications of the kind of legislation they require, eg. in the compensation for public taking of property rights, control over subdivisions, over land speculation, over rent and over other activities must be examined by policy makers.

(8) Capital formation for resources and other development should be stimulated. But it should be recognized that many countries of the ECAFE region will require external sources of investment capital if rapid development is to take place.

(9) The social aspects of planning for resources have often been neglected. Among the problems are those of minority groups, of housing and of other social services and facilities.

(10) International cooperation for regional resources development will be necessary in various situations. One of these situations is that of the river valley basin cutting across the boundaries of two or more countries.

(11) The responsibility for planning and for development, that is for the execution of planning decisions, should be adequately co-ordinated.

(12) Training and research programmes should be reinforced. Training for planning must cover socio-economic as well as physical aspects. Planning trainning should also be incorporated in the curricula of

the engineer and other professionals. An inventory or reservoir of needed research projects should be developed. An especially important problem is that of methods for formulating standards.

(13) Manuals on survey and planning techniques should be prepared. Though planning developed as a technique in the advanced countries cannot be exported without suitable adaptation to local conditions, it is a process which has wide applicability. The manuals might cover such methods and techniques as the use of small samples for population and social and economic characteristics, simplified transportation flow analysis, mapping and aerial photography for resource planning, land use surveys and capital budgeting.

(14) Continuing evaluation of programmes and of goals must be undertaken. Such evaluations of programmes and of goals, as they are undertaken, should be shared among all the countries of the ECAFE region so that they can serve as a basis for future planning policy and decisions.

7 -d. The establishment of a special authority is one, but only one, device for regional planning for resource development. Its peculiar advantages are that it concentrates clearly on the special problems at hand, that it can take a fresh approach to these problems, and that it may operate free of many of the usual restraints upon governmental agencies. Its disadvantages are that it can, because of its special nature and independence, sometimes stand in the way of a comprehensive approach, that it can and often does outlive its special purpose and usefulness. Given these considerations, several criteria should govern the establishment of a special authority:

(1) It should be created only upon a clear showing that circumstances are such that existing agencies and units of government are not adequate to the purpose at hand.

(2) In no case should the authority be regarded as a substitute for a general process of government at the national, state or local level, or as a permanent replacement for the regular administrative agencies of such a general government.

(3) For the job it is being assigned to do, the authority should have ample power and freedom to act, within a determinate time period.

Regional Planning Considerations in the Location of Industries.

8. Senator Gonzalez was chairman of this group, K. Vyasulu was discussion leader, and Ahmed Ali was rapporteur. Conclusions follow:

a. Consideration of national and regional planning should permeate plans in the national economies for the organization of industries in accordance with the conditions of the domestic market in any given period.

b. The need for the centralization and integration of industries should be given due weight when the over-all advantages to the national economies are being considered.

United Nations... Report of the Tokyo regional planning seminar --10

8 -c. But industries might be organized, whenever possible and desirable, on a non-integrated basis - for example, aluminium, paper, etc. - and the decentralization of processes may be planned in the interests of wider dispersal of industry.

8 -d. Industries may be located at a distance from the existing centres of congested metropolitan areas and other overcrowded cities as a result of the multi-purpose river valley schemes covering flood control and the development of hydro-electric power, irrigation and navigational facilities.

8 -e. Industries, (large, medium and small-scale) have considerable chances of development in the river basins and should be regarded as an integral part of the effort to stabilize and expand employment opportunities. The development of such industries, accompanied by an adequate economic and social infrastructure, should become an important force in countering the push and pull factors currently in operation which accentuate the problems of metropolitan areas.

8 -f. Industrial estates provide a useful means of economically organizing land uses for industrial development. These estates, if located outside of large urban areas and provided with existing or new housing and community services, can discourage the migration of population to large urban centres. But even in large centres, industrial estates provide the opportunity of scale economies and the segregation of potentially harmful land uses from the living quarters.

8 -g. Executive authorities might be empowered to license new industrial establishments and to permit the expansion of existing undertakings. This would be of considerable help in orienting the growth of industries in accordance with the reorganized needs of regions and in preventing excessive concentration at points where further expansion is undesirable.

8 -h. The provision of incentives for attracting industries to the desired locations including weightage in the matter of financial assistance by institutional agencies could supplement the licensing powers. Among other things, the incentives could take the form of tax concessions and supply of facilities such as power, water, etc. on favourable terms.

8 -i. A close analysis of the probable demands for specific industrial products within national economies might disclose scope for cooperation among ECAFE countries. Studies could be undertaken into this issue on the lines adopted by the ECLA secretariat in respect to the economic integration of the Central American States.

8 -j. In connexion with the establishment of capacity in different industries, particularly capital and producer goods (industries involving large financial investments) comprehensive consideration should be given to the various locational factors and to the size of economic units in order that efficient and successful operation of the plants may be ensured.

8 -k. Hydro-electric power, coal and other sources of energy such as natural gas and petroleum provide, generally, the basic facilities for the establishment of industry. The scope for specific industries, however, wholly depend on the further availability of various types of raw materials.

8 -l. The raw material base for industries is being continuously widened through the exploitation of by-products and waste products, the discovery of new processes of manufacture and of substitutes for various traditional materials. Surveys for mineral raw materials and research into the possibilities of enlarging the availability of raw materials for setting up industries, particularly in less developed areas, should get adequate recognition in the planning and development processes.

CONSTRUCTION

E.F.T.

Wells, Edward H.
SAND-VIBRATION REDUCES FOUNDATION COSTS 20%
Engineering News-Record, August 28, 1958. pp. 30-32. Illustrations.
624.15 (73)

1. In one kind of soil, regardless of water table or footing elevation, it was found cheaper to use compaction methods than to sink piles. The author, chief engineer for Sargent-Webster-Crenshaw-Folley of Syracuse, N.Y., was responsible for the solution offoundation problems at the three sites.

2. The problems were three new school sites in the Schenectady-Albany area of New York State. The common feature at all three sites was the soil type. Subsurface investigations indicated the soil was generally a uniform, loose, fine sand with traces of silt from the surface to a depth of 20 to 30 ft. Ground-water at or above probably footing elevations existed on two of the sites, and it was apparent that normal spread footings were not feasible so that extra cost would be necessary in the construction of the foundations.

3. A foundation possibility in each case was to sink end-bearing piles to hardpan or shale below the loose sands, but the cost looked high. At site A, an elementary school of one story design, 20-ton cast-in-place concrete piles averaging 40 ft. in length would have cost $55.000. For site B, a two-story junior high school, 30-ton piles 60 ft. long would have cost $105,000. And for Site C, a two-story senior high school (in a different town from the first two sites), 30-ton piles 35 ft. long would have cost $90,000. More economical ways were sought.

4. Further studies included mechanical analysis of the boring samples and investigation of dewatering and compacting methods. The sieve analysis revealed unusual soil grain-size characteristics. Samples taken from ground surface to 20 ft. deep on all three sites consisted of about 80% fine sand with a very narrow range of particle sizes.

Site A

5. On the site of the elementary school it was found that the water table could be permanently lowered by a gravity drainage system at moderate cost if the building floor elevation were raised two or three feet above existing grades. Slab-on-grade construction typical of most of the building, resulted in few concentrated loads and very low unit loading on foundations. Settlement calculations consequently indicated that only a relatively shallow compaction of the material under the footings would be necessary.

6. After the drainage system was installed, base-course fill was placed and compacted along the footing lines. Earth down to 2 ft. below the bottom of the footings was replaced with a clean, select gravel fill. The material was spread in 12 in. layers by a bulldozer and compacted to 90% relative density. The job was done by vibrating rollers, a fairly new method of compaction developed in Sweden and introduced into the USA about five years ago. Three passes were enough in most cases.

7. The total cost of the compaction work and additional cost in the drainage system, above that normally required, was $25,000 -- or about $30,000 less than the usual cast-in-place piles.

Wells, Edward H. Sand-vibration reduces foundation costs 20%

Site B

8. The conditions found at the site of the junior high school near Site A were more difficult. It was impossible to lower the ground-water table appreciably on a permanent basis. Compounding this problem, building loads were much heavier than for the elementary school -- meaning that sand had to be compacted to a greater depth.

9. The problem of deep compaction -- mostly below the water table -- was solved by a proprietary system, "Vibroflotation." It was developed for compaction of granular soil in Germany shortly before World War II and introduced to the USA in the late 1940's. The main item of equipment is a cylindrical steel casing tipped with water jets and containing an electric-motor-driven eccentric rotating weight as a vibrator. The casing jets itself into the ground to the desired depth, its penetration aided by the vibrator. The vibrations consolidate the surrounding sand. As the grains move closer together, more soil is introduced at the surface to fill the space and the casing is withdrawn slowly. The result is a compacted sand cylinder about 8 ft. in diameter. Compaction at this site was specified for a depth of 20 ft. Along the line of continuous footings, single penetrations of the casing were called for every 6 ft. The job was carried out from an elevation 10 ft. above the level of the future footings. A relative density of 60% was specified and well exceeded. This permitted design soil bearing values of 1.5 tons per sq. ft. for conventional spread footings.

10. The job required about 700 compactions. Including site clearing, this phase of the work took about a month and cost $52,000. Piles would have cost at least twice that much.

Site C

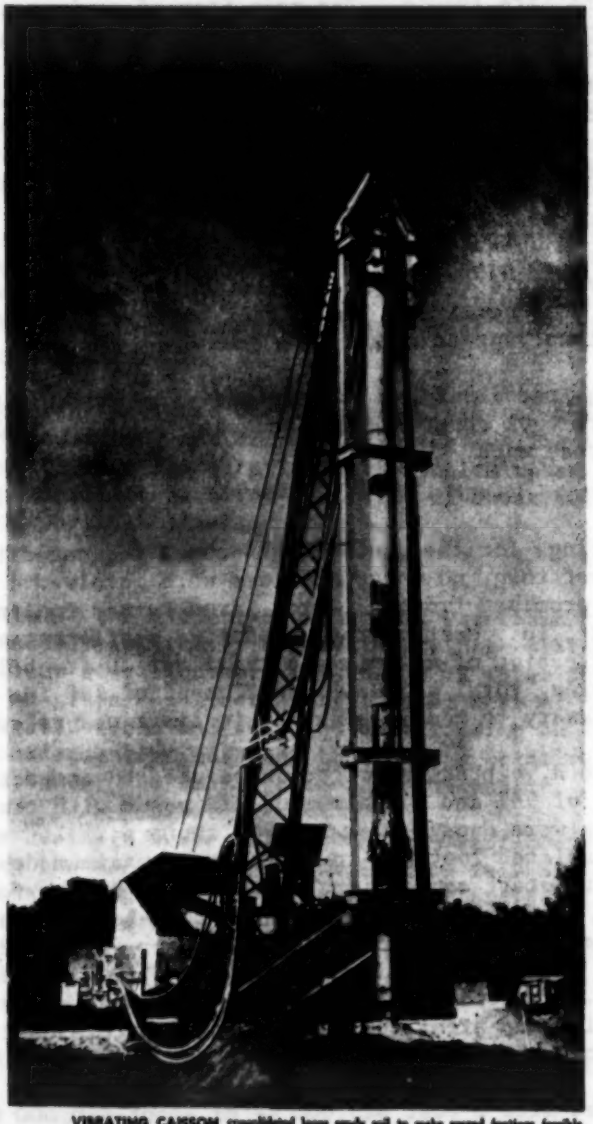
11. All the borings for the senior high school indicated that, unlike the two sites in the first town, no water problems were involved. Greater building loads, however, promised trouble. Even large spread footings were considered likely to settle 5 in. Most of this predicted settlement was attributed to anticipated compression of material in the first 10 ft. below the footings. For design purposes, total allowable settlement of 1.5 in. was assumed, and the density necessary to remain within this limit was calculated.

12. As with Site A, vibrating rollers were used to compact the sand. Minimum relative density of 96% and a minimum of six passes with the roller were specified. Six passes were enough over most of the area. It was necessary under heavily loaded isolated footings to trench to a maximum depth of 5 ft. below footings grades to start compactions. Under most of the footings, however, the work was done at grade of footings. Design soil-bearing values for the spread footings were again taken as 1.5 and 2.5 tons per ft. Load tests performed before and after compaction indicated that the operation cut settlements by about two-thirds. Reductions were much greater where materials were loose. Observations during and after construction showed total settlements were considerably less than the originally assumed maximum.

13. Compaction at Site C cost $25,000 -- or about $60,000 to $65,000 less than piles.

Wells, Edward H. Sand-Vibration reduces foundation costs 20% --3

14. All three schools were designed by Sargent-Webster-Crenshaw & Folley of Syracuse, N.Y. B.K. Hough of Ithaca, N.Y. was consulting engineer on soils and foundations (solution of foundation problems by Wells) and prepared the specifications for the compaction work on all sites. At Site B, Vibroflotation Co., of Pittsburgh, Pa., US licensees of the German originators of the vibrating caisson method of consolodation, did the site clearing and compaction. At other sites compaction was performed by contractors involved.



VIBRATING CAISSON consolidated loose sandy soil to make spread footings feasible. Alternative was piles, at considerably higher cost.

D.F.T.

Engineering News Record
PAKISTAN'S HUGE EARTH DAM
July 24, 1958, p. 55. Illustrations.
627.8 (549)

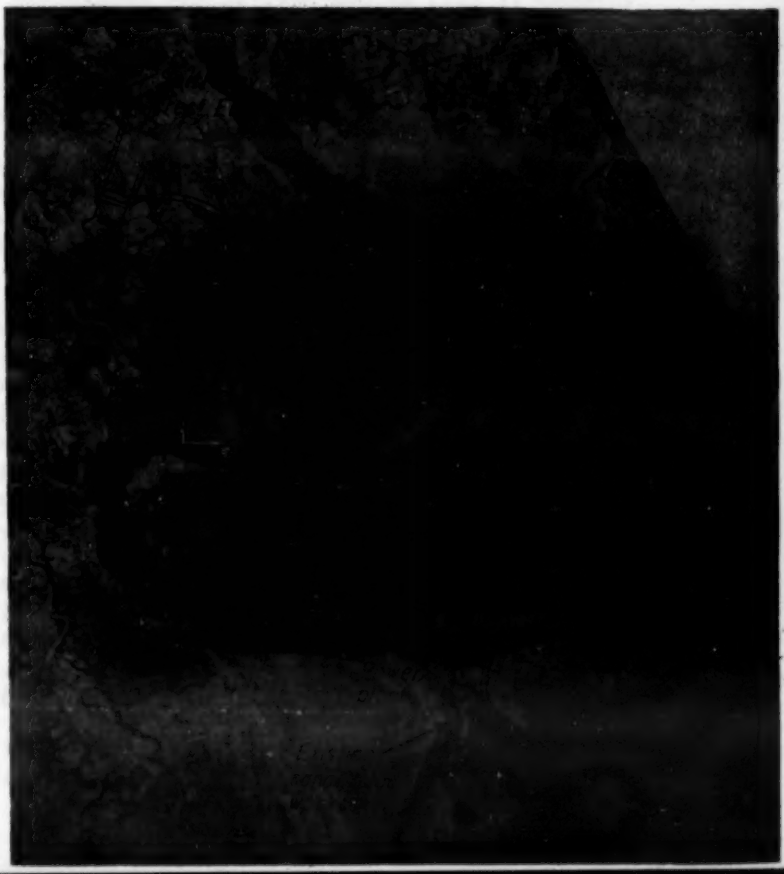
1. Pakistan has started construction of a $200 million earthfill dam near Mangla, on the Jhelum River in West Pakistan. The dam, huge by any standard, will be a rolled earth embankment of 53,000,000 cubic yards.

2. The dam will control discharges of the Jhelum for power and irrigation. With a drainage of 13,000 sq. mi. extending into the Himalaya range, the river has a disproportionately higher summer flow because of melting snow and monsoon rains. Average flow varies from 5,000 cubic feet per second (cfs) in winter to more than 100,000 cfs in summer. Its annual average discharge is 23 million acre feet.

3. The powerhouse on the dam's left flank will have an installed capacity of 300,000 kw. Each of four 75,000 kw units will be served by a 26-foot diameter tunnel. The spillway on the right will have 38-foot high radical gates and an effective width of 800 feet to pass a design flood of 100,000 cfs.

4. The dam will have a crest length of 9,000 feet and will be 365 feet high. Its effective storage capacity will be 3.5 million acre-feet. More than 3 million acres will be irrigated. Irrigation supplies passing through the powerhouse will be enough to meet a firm load of 200,000 kw.

5. The main dam will have five zones, the central one serving as the impervious core. The selected earth portion will be surrounded by filter zones of river run sand and gravel. On the upstream side, the filter zone will slope, but downstream of the core it will be vertical and of uniform thickness. Upstream face will be placed on a 2.5:1 slope.



6. The dam is expected to be completed in eight years. Abdul Hamid, of Pakistan is chief of the project. Tipton & Hill, Inc. Los Angeles, prepared feasibility report. Harza Engineering Co., Chicago, and Binnie, Deacon & Gourley, London, have been engaged to prepare final design and to supervise construction.

D.F.S.T.

World's Business
BUILDING "THE WORLD'S TOUGHEST" DAM
July, 1958, pp. 5-8. Illustrations.
628.8 (540)

1. This is a description of the methods and materials used in the construction of India's great Bhakra Dam.

2. "The world's toughest" as applied to the Bhakra Dam is no misnomer. Every contractor who visited the project has agreed that nowhere have the problems of supply, river division, labor and topography been more difficult. Bhakra is 220 miles north of Delhi in a narrow canyon so steep that Sutleg River floods last hours instead of days. The flow of this river can reach 276,000 cfs. The dam will rise 760 feet above bedrock, will be 1700 feet long and 650 feet wide at its widest base point. Its 5.5 million cubic yard concrete volume makes Bhakra the highest gravity section ever built. The first-stage diversion coffer-dam was the highest earthfill structure (235 feet high) ever built in India.

3. Bhakra's 7.5 million acre-foot reservoir will put over 6 million new acres of land under cultivation, and the dam will produce 930,000 kw through ten generators. Some 630,000 kw of this total will be firm power.

4. Mr. Harry Slocum (who built the Grand Coulee, Bull Shoals and other great dams in the US) was first approached by the Indian Government in 1945 when Bhakra was still only a 460-foot dream. He was reluctant to take on the project, but he did recommend that the job be done by contract. And, to stress to Indian engineers what they were up against, the wrote a letter outlining a tentative list of equipment that would be needed, by make and model.

5. Instead of letting the job by contract, the Indian Government decided to undertake it herself. By 1949, when Indian emisaries persuaded Mr. Slocum to visit the dam, he found --much to his surprise -- most of the equipment he had mentioned in his letter had been ordered and delivered. In addition, a consulting board of engineers had placed Bhakra's height close to 700 feet. For Mr. Slocum, the challenge was irresistible -- even though he was still finishing the Bull Shoals Dam in the U.S.

6. When Mr. Slocum undertook the staggering Bhakra project in 1952, U.S. manufacturers had so large a sales backlog that delivery was questionable. In some cases it was necessary to take whatever was available. Also at that time, buying methods traditional with the Indian Government were in use. Purchases all had to be made through manufacturer' agents in India. It was not a system conducive to economy and speed. after several experiences with equipment which arrived months after the need for it had ceased to exist, Mr. Slocum, was able to get the system changed.

7. The first step was the application of purchasing rules which should be basic with any buyer of construction equipment, according to Mr. Slocum; and a project which is over-engineered and over-equipped simply increases the amount of money tied up on warehouse shelves. One way to avoid this is to standardize the equipment used in various parts of the job. For example, one motor is standard for all conveyor runs, and all the spare parts needed are "a spare motor, a set of controls, a rotor, and a set of coils." The same selectivity should be excercised in regard to motor horsepower: In most instances 10, 20,

World's Business. Building "the world's toughest" dam --2

50-- possibly 75 and 100 -- and 150 horsepowers will cover all possible needs without stocking up on the in-between sizes. Conveyors themselves are standardized on a 30-inch minimum, with other stocks of 36-inch and 42-inch; and this avoids filling warehouses of rolls of belting not needed, simplified splicing, and cut down the investment in idlers and takeups right down the line. Mr. Slocum explains:

> "Those are basic rules. If you're buying for a construction job, that rule of standardization should govern what you do. And it is an absolute must in increasing degree as you move farther and farther away from your source of supply."

8. Construction of the main barrier, the 50-foot penstock tunnels, a 260-foot overflow spillway and massive tainter gate system are all being performed with mainly unskilled labor. It is undoubtedly one of the most difficult projects ever attempted. To accomplish these tasks, Mr. Slocum established a steady flow of equipment, materials and spare parts on a planned-purchase basis, cutting through "red tape" which had been traditional for centuries.

9. Standardization of buying enough to simplify the job of training men was a major accomplishment. All the personnel on the project -- except for 35 supervising Americans -- are Indians, completely without previous experience in operating and maintaining such equipment. And Bhakra is over 700 feet high and contains 5.5 million cubic yards of concrete: a job of such a size requires the right equipment, along with the skilled men to keep it running.

10. Turning to the problem of shipment of equipment, Mr. Slocum worked closely with the Bhakra Control Board. He set down a supplementary list of the equipment needed to finish the outlet-diversion tunnels and get the cofferdams and the dam itself under way. Armed with authorization, he turned his attention to several well-known U.S. manufacturers to get exactly what he wanted. This meant equipment and machinery with interchangable parts, simplified and dependable.

11. To speed shipments, an Indian technical attaché was stationed in Washington D.C. to concentrate on the Bhakra Dam exclusively. Operating independently of the Embassy and aided by an American who had done much of the buying for Bull Shoals Dam, a buying process was set up. Good prices were obtained--in one case the same price offered the U.S. Government. One hitch was the insistance on a letter of credit by some manufacturers.

12. The Washington office has circumvented this by building up a reputation for quick payment. A steady-flow method of buying has been established, with payments controlled directly by Washington, D.C. Buying has been highly simplified. Bhakra's control board, acting usually on Mr. Slocum's recommendation, decides on equipment by make and model number. Governing the selection are productive capacity, availability, ease of maintenance, and price -- in about that order of importance. The "buy-order" then is cabled or air-mailed to the Washington representative. In all such cases, exactly what is wanted is bought. There is no bidding of manufacturers unless the make and model are unspecified.

World's business. Building "the world's toughest" dam. --3

13. As a result of this type of operation, India's credit rating with U.S. equipment manufacturers is among the very highest of any government agency. On one recent shipment of shovels, the Indian representative urged a manufacturer to speed shipment and was challenged to a speedy payment. The shovels were shipped 11 days later. On the 14th day, less than 48 hours after the certified notice of delivery was received, the manufacturer had India's payment of $30,000. Under these conditions, the delivery-time has been cut from 18 months to 6 months.

14. Forward looking leaders in India have seen and liked this kind of buying. They are extremely proud of Bhakra's massive concrete bulk -- now pegged at 760 feet -- which is rising rapidly. More than 30 men have now been trained to handle the biggest pieces of equipment. Other personnel have become experts in simplified maintenance. Bhakra is probably one the most mechanized construction jobs ever done in the world, thanks to sound selection and buying of equipment.

GENERAL

A.B.D.P.Q.

Clark, Jocelyn G.
INDUSTRIALIZATION PROBLEMS IN THE TROPICS
Town and Country Planning Summer School, Overseas Section, Bangor (England)
August, 1958.
711.2 (213)

1. This paper deals with some of the most important factors in industrial location and hopes to assist in providing the elements of economic judgement needed for the successful elaboration of specific town planning in the tropics. Jocelyn G. Clark, is economic adviser to the United Africa Co.

2. The question of industrialization is a vital one in any country. It has acquired added importance in most under-developed areas because, in the minds of most people in those countries, industrialization has become synonymous with progress and the establishment of a modern society. The task of the friendly outsider is to help where he can with capital and technical skills; and (when he is asked) with detached advice on how best to proceed with industrialization and how to make it succeed. If the techniques of the town planner are to be of much use, he must first make an assessment regarding the number and size of industries which are likely to be established in a given area. An appreciation of this kind demands a general understanding of the problems and obstacles to industrialization and of the policy measures which are likely to encourage or discourage this kind of development.

3. In practice, industrialization is only one facet, though an important one, of development; and it constitutes only part of any national investment programme -- other major areas of investment being in public utilities, agriculture and commerce. One aim of a government should be to ensure that the four areas of investment keep in step, for any backward sector will tend to drag down the others. Another aim should be to see that the right amount of investment is taking place: the right amount is broadly defined as the maximum amount possible within the limits of total available domestic savings plus imports of capital from abroad. If investment exceeds this aggregate, the result will be depletion of foreign exchange reserves and probably inflation -- which distorts the economy, causes social dislocations and frustrates the future will to save. The long run amount of investment which can be carried out will be determined by the success of present efforts to increase savings, and great stress should be laid on this factor.

4. INDUSTRY VS. AGRICULTURE. In trying to determine the chances of industrialization in an underdeveloped country, it is useful to start by looking at what is being done to encourage agriculture--often the key to the future. There are two fundamentally different ways of approaching industrialization in an underdeveloped country. The first is to tax heavily the farming community and to exact from it thereby the forced savings with which to finance industrial development. This system in its extreme form is possible only in a dictatorial regime since it means deliberately depressing the lot of the farmers who, in underdeveloped countries, make up the majority of voters. Also the strains which such a policy must engender, together with political considerations, do not create conditions favourable for attracting foreign capital. (A country like the Soviet Union which is self-sufficient as to resources may succeed, but most of its satellite countries have been less successful.) The second solution is to achieve industrialization, not by depressing agriculture but by encouraging it and allowing industry to stem naturally from a prosperous agricultural community. This was somewhat the industrialization pattern of Europe and America where prosperous, untaxed farmers provided both capital and markets.

Clark, Jocelyn G. Industrialization problems in the tropics --2

5. The trend in many underdeveloped countries in recent years has been a middle course between the two above extremes. In parts of West Africa, for example, the farmers are taxed through export duties, produce sales taxes and the operations of the Marketing Boards. The sound principle on which the Marketing Boards are based is that of evening out wide fluctuations in world prices for agricultural commodities, thus providing a reasonably fixed income for the farmer. With a statutory monopoly on export of the main types of produce, they determine prices to be paid; and with continuing high (on balance) world prices, the Marketing Boards have accumulated very large surpluses. In Nigeria, where about 75% of sales were passed on to farmers, some £200m. has been withheld as taxes or fed into Marketing Board reserves since the middle of the war. In the case of Ghana, farmers received only about 55% of cocoa export prices over a fifteen year period ending in 1956.

6. There are advantages and disadvantages to this system of withholding a large share of gross agricultural incomes. One advantage is that the reserves of the Marketing Boards are in foreign exchange and could cushion any future slump in world commodity prices; also these reserves make for stability as a basis for a gradual policy of industrialization. A second advantage is the availability of tax funds and loans and grants from the Marketing Boards to governments for the financing of roads, railways, public utilities, etc., with are a necessary prerequisite for substantive industrialization.

7. It is not an issue as to whether the economically backward country should industrialize but rather as to how they should proceed. Agricultural development is not an alternative to industrialization; it is in nearly all cases an essential prerequisite. This is true for three major reasons:

a. An increase in farm income provides a larger and wider market for industrialized goods and the incentive to domestic production;

b. The increase in agricultural output means higher exports and hence greater availability of foreign exchange to buy abroad the capital equipment and raw materials needed by industry;

c. The increase in agricultural output per man frees labour for industry; with more efficient agriculture more food can be produced with smaller farm employment.

8. BASIC REQUIREMENTS OF INDUSTRY. The five basic requirements of any programme of industrialization are capital, labour power, raw materials, and markets. A common feature of underdeveloped countries is a shortage of capital. Many governments raise capital through current budget surplus and use these funds for development projects. But these are barely adequate for road building, other means of communication, electrification, and other public utilities. There is usually little money left over for industrialization projects. Thus capital must often come from private sectors of the economy and from abroad. A further complication is that most private capital tends to find its way into land, buildings or other fixed assets rather than industries because of the high interest rates in underdeveloped countries and the low relative risk involved.

9. Capital. Most underdeveloped countries want foreign capital, but want to make sure that the ownership of industry does not fall exclusively into foreign hands. This is the basic dilemma. But the governments can do much to attract

Clark, Jocelyn G. Industrialisation problems in the tropics --3

scarce foreign capital without surrendering their national prerogatives. India has built a guarantee of compensation to the foreign investor (in case of nationalisation) right into the constitution. Also the governments must not be too restrictive of the conduct of the industries, or investors will be scared away. Restrictions on taking profits out of the country must be made reasonable, as short term political and currency reserve gains will offset by long term economic costs. Where industries are in competition, profits will not be excessive and should probably not be restricted; but where competition is impossible or extractive monopolies are involved special consideration is in order. Stability and dependability of stated policy is also considered by potential investors.

10. One perfectly understandable and intrinsically quite legitimate desire is that industrial buildings in a town should conform to certain architectural standards of taste. Also many countries have taken a somewhat paternalistic attitude to labour, and great emphasis is put on the provision of canteens and food, showers, and often workers' housing. While these are socially desirable, it must be faced that they involve initial and/or operating costs which may make the whole prospect of investment unprofitable. It is possible then for a country to be worse off financially because of its fine social laws.

11. In many cases governments of underdeveloped countries have established industries in partnership with foreign companies. There is a great deal to be said for this formula. The contribution of the government may be capital, the provision of land, market research, organising the supply of labor, granting priorities for power, etc. While this system is welcomed by many industrialists for reasons of security, they see some drawbacks in the infusion of political considerations hampering the efficiency of the enterprise. Where a government goes into partnership with a private company it should clearly delegate the task to only one department or government agency and ensure the latter the proper authority.

12. Labour. Labour in the tropics is not always cheap and not always abundant. Productivity is especially low--only partly because of nutritional failings. Labour is very static in poor countries, and there are many factors, such as tribal or community associations which block economically desired distribution of the population. There are some large seasonal migrations, but usually an African will feel himself a foreigner in a village a few miles from his home.

13. Lacking a reservoir of skilled labour, the industrialist operating in the tropics must often bear the heavy cost of training schemes and schools; and this is in effect an increased cost of labour. Yet industrialists are ready to provide training of this sort, in return for good public relations and as a means of avoiding the heavy costs (in leave travel, repatriation, etc.) of employing expatriates. Besides technical 'know-how' and capital the main need in the tropics is managerial skill through experience. There are no short cuts to developing managers, and these will have to be imported for some years into the tropics. But good managers are in short supply even in highly industrialized countries, and this is one of the greatest impediments to industrialization of new areas.

Clark, Jocelyn G. Industrialization problems in the tropics --4

14. Power. Power is a further basic prerequisite to the establishment of most industries. Except in rare cases, hydro-electric power is about the only feasible source in the tropics. But there are stream-flow problems, with very sharp seasonal variations in smaller streams and commercially prohibitive problems in damming the great rivers. Enough demand has not yet been built up. (The scheme to dam the Congo river at Inga would cost well over £1,000m. and the amount of electricity produced would be 13 times that of Bratsk station in USSR, the world's largest; and while such power would be uniquely cheap, it will be many years before effective demand for this amount of power can be expected.) It is often true that the industries most likely to succeed in the tropics initially are those require little power or which provide their own power. Sugar factories, sawmills and mills extracting palm oil from the fruit can provide required power by burning their own waste material.

15. Raw Materials. In the tropics industries which use raw materials and manufacture for export may be successful if the raw material loses weight or bulk in the course of processing. Sawmills, in which nearly half of the weight of a log is removed in processing, are well located near forests. So are plywood factories, but furniture factories are not because of the added bulk and resulting transport costs. It is cheaper to carry sugar than sugar cane, palm oil than palm fruit. Bauxite is a special case: it takes four tons of bauxite to make one ton of aluminum; but such great quantities of electric power are required in the process that the alumnium has been carried to the power source--often great distances, as between British Guiana and Jamaica to Canada. This provides the economic rationale for the establishment of large hydro-electric schemes in French West Africa, where bauxite is found; and it is also the basis for the Volta River Scheme in Ghana. Copper concentrate is similar in Uganda, being transported some 300 miles by rail to Jinja, adjacent to the hydro-electric plant and dam at the source of the Nile. In goods imported, conversely, it will usually be better to buy the processed product (steel over iron ore) because of transport and power factors. But where there is little loss in weight or bulk (eg. latex-rubber or cotton-textiles) the transport factor will not be very important.

16. Markets. Generally the best industries will be those which use local raw materials to manufacture for the home market, provided the market is large or wealthy enough. The least promising will be those which use imported raw materials in manufacture for export. The only economic test that can be applied to the success of a given industry is whether it can, after a reasonable 'running in' period, manufacture at competitive prices (landed cost after payment of existing import duties for imports).

17. LOCATION OF INDUSTRY. One of the ways in which government can assist industrialization is the provision of industrial estates. Because land ownership and title is often unclear and uncertain, this governmental service is appreciated by industrialists. Many industries are "linked" to each other and a direct saving in cost may arise if they are located one next to another on an industrial estate. (Eg. a brewery, a bottle factory, a bottle cap manufacturer and a label printer.) But there are certain economic costs in the provision of industrial estates which are often overlooked. Strain on railways and power may be greater than in the case of dispersal, and this may require unnecessary government expenditures for public works. Strain on labor supply may result in housing shortage and inflation. Also industrial estates are not

suitable for larger units with special requirements such as dock facilities, large water supplies, waste disposal; and there may be also questions of nuisance in certain industries. Finally, some industries must be close to their supplies of raw materials. When planning industrial estates there is a need for realistic expert treatment of the technical requirements of industry; and special consideration must be given tropical conditions, including rainwater and site erosion as well as possible engineering problems due to high humidity.

18. FISCAL PROBLEMS. Many governments in underdeveloped countries are highly dependent on import duties as a source of income. Where industries in competition with the imports are established, sharp (but temporary) drops in governmental revenue may be expected. This means that such industries should not be brought in all at once, but rather phased over a five- to ten-year programme. The problem of raising new taxes to fill the gap in revenue must be handled carefully: rather than increasing duties on the import in question or taxing the new industry heavily during its early years, it is perhaps better to spread the new tax burden evenly over the economy as a whole.

D.P.W.

von Vorys, Karl
PRIVATE ENTERPRISE AND ECONOMIC DEVELOPMENT
Political Research: Organization and Design, I: 4. March 1958. pp. 29-30.
338 (100).: 711.12

1. This is a note sent by Professor von Vorys to a new periodical for the exchange of ideas and information among political scientists and those from related disciplines.

2. An increasingly important element in international politics is the industrialization of underdeveloped countries. While significant progress has been made in many of these countries, the existing gap of per capita income between them and the so-called advanced countries is not decreasing. In fact, there is much evidence that it is widening. At the same time popular pressure is becoming so acute on this subject that in an increasing number of underdeveloped countries national and local elections are being fought almost exclusively along these lines. All too often the governments and the electorates single out "Western imperialism" as a scapegoat for an economic development which is less rapid than they desire. Meanwhile the Communists point with pride to their model, the Soviet Union, as possessing the economic system which within a few decades transformed a backward agricultural economy to a first-rate industrial power. Any slowdown in the rate of economic growth, therefore, is grist for the Communist mill.

3. The important role of public finance and governmental planning in the initiation of industrialization must be admitted. Some underdeveloped countries are fortunate enough to possess valuable natural resources (oil, rubber) or a large agricultural surplus (rice) which finance imports of capital equipment. Other nations, however, have to fall back upon taxation as a means of accumulating funds for capital imports. In any case, the government must undertake the construction of the social overhead (e.g. roads, railroads, power stations, etc) because:

a. Existing domestic demand would not warrant such expenditure, and

b. It can be financed only through long-term, low interest loans which are not very attractive to domestic or foreign private investors.

(British and French investments in foreign, including colonial, social overhead during the nineteenth and the early twentieth century were the result primarily of political objectives and of the highly unusual fact that the marginal efficiency of capital at home was extremely low.)

4. Although government planning is perhaps essential in launching a program of industrialization, it has one major weakness: political control. Thus economic efficiency predicated upon a long-run development may be jeopardized by immediate political advantages.

a. As the process of capital formation proceeds, the demand for consumers' goods will rise sharply.

b. Increased political, social and cultural contact with advanced industrial countries increases the desire of the electorate in an underdeveloped country for a higher standard of living, i.e., again more consumer goods.

The popular pressure to divert development funds (i.e., government funds allocated for capital formation) to short-term consumption may well become politically unbearable.

von Vorys, Karl. Private enterprise and economic development --2

5. Given these conditions there are three courses open to the government. (These three courses are theoretical prototypes and in reality exist only in a mixed form).

a. Arbitrary enforcement of a low level of consumption. This is impossible for an extended period within the democratic political framework. It would necessitate the existence of establishment of an authoritarian form of government.

b. Submission to electoral demand and diversion of capital funds to current consumption. This would rapidly brake the rate of economic growth, and if pressure for consumer items continues or even increases, runaway inflation and the demoralization of the economy is likely to follow.

c. Encouragement of domestic and foreign investment to enter into and expand domestic production of consumers' goods. Here existing demand and profit rates are favorable. The development of a strong private sector in the economy concentrating on domestic production of consumers' goods would:

1. Release foreign exchange (previously tied up in imports of consumers' goods) for capital formation.
2. Relieve the inflationary pressure;
3. Relieve the political pressure for diversion of capital funds to current consumption;
4. Accelerate economic development.

6. "Government can encourage and can foster private enterprise. It cannot create it. Social and cultural factors play a preeminent role in such vital areas as savings habits, investment patterns or entrepreneurship. The prevalent concept of the nature of property (absolute or relative possession, use, etc.) for example, will largely decide what form the income margin over subsistence level will take. Similarly the rigidity of the social structure, i.e., the ease with which one may acquire increased prestige and power , the value priorities within the social structure which determine the criteria for advancement (accident of birth, military values, wealth, etc.) will indicate whether there can be a valid expectation for private investment on the broad scale. In terms of this model then the answer to the question whether a type of capitalist ethic exists, even in the early stages of an underdeveloped country, assumes major importance."

7. Such a study need not be based in all cases upon individual countries. For example, some of the Arab countries; the countries which formerly comprised French Indo-China; or some parts of Africa may well be considered on a regional basis.

8. Among the methods used in a project of this kind are:

a. Family budget analyses;
b. Evaluation of bank deposit patterns;
c. Study of credit politics;
d. Analysis of the social background of existing stockholders and commercial and industrial managers; and
e. Elite studies.

9. Much work has already been done in collection of data (e.g. World Bank reports), but so far no systematic attempt has been made to correlate material available.

APPENDIX

EXAMPLES OF CURRENT WORK BY DOXIADIS ASSOCIATES

THE FUTURE OF KERBALA

Project QGHP 65

A long term program and a master plan for

the development of the city and its region

Summary of the Interim Report (Document DOX-QA 74, 1-9-58) issued to initiate discussions for the future of Kerbala with the Government of the Republic of Iraq Development Board and Ministry of Development - Technical Section 5.

D.I.M.O.Q.

The Future of Kerbala, Iraq, 1958.
711.41 (56)

INTRODUCTION

1. This interim report gives an analysis of the existing conditions of the town and sets out its present and future problems. It also develops the major policies which should govern the solution of these problems and proceeds to the presentation of a long-term program, covering a period of about 25 years, and a special one for immediate action. Finally, through the attached master plan, it includes the general proposals for the physical expression of this program.

2. Kerbala, one of the major cities of Iraq, lies 104 km S-SW of Baghdad. In 1957 it had a population of 60,804 people, of whom 27.1% were foreigners, mostly Iranians. It is the capital of the liwa which has the same name.

3. In comparison with the other districts of Iraq, Kerbala region is the driest with the lowest rainfall. Temperatures are among the highest.

4. Its history began in 680 AD when Imam Hussein, the son of Ali, was buried in that area. His grave became a place of pilgrimage for the Shiite Moslems. People started building houses near the grave and thus Kerbala city was founded. At a later date two magnificent mosques were erected there. The first on the grave of Imam Hussein and the second on the grave of Imam Abbas, who was also buried in the town. Kerbala developed between and around these two mosques and eventually became circular shaped, very densely built, with houses, shops and workshops all intermingled.

5. The old town, developed around the two Mosques of Hussein and Abbas, is clearly distinguished from the rest of the city. Its total area is 50 hectares. In 1920 the town included a small extension towards SE planned on the gridiron system. The total area of the town was at that time 80 hectares. After 1925 the town expanded southwards up to the railway station. Only a small part of that area has been built up. Further southward expansion occurred after 1956 on the other side of the railway installations, where "Hussein's town" was founded. Already more than 200 houses have been built there. In 1958 the construction of a government housing scheme for about 860 families commenced at the southermost end of the town.

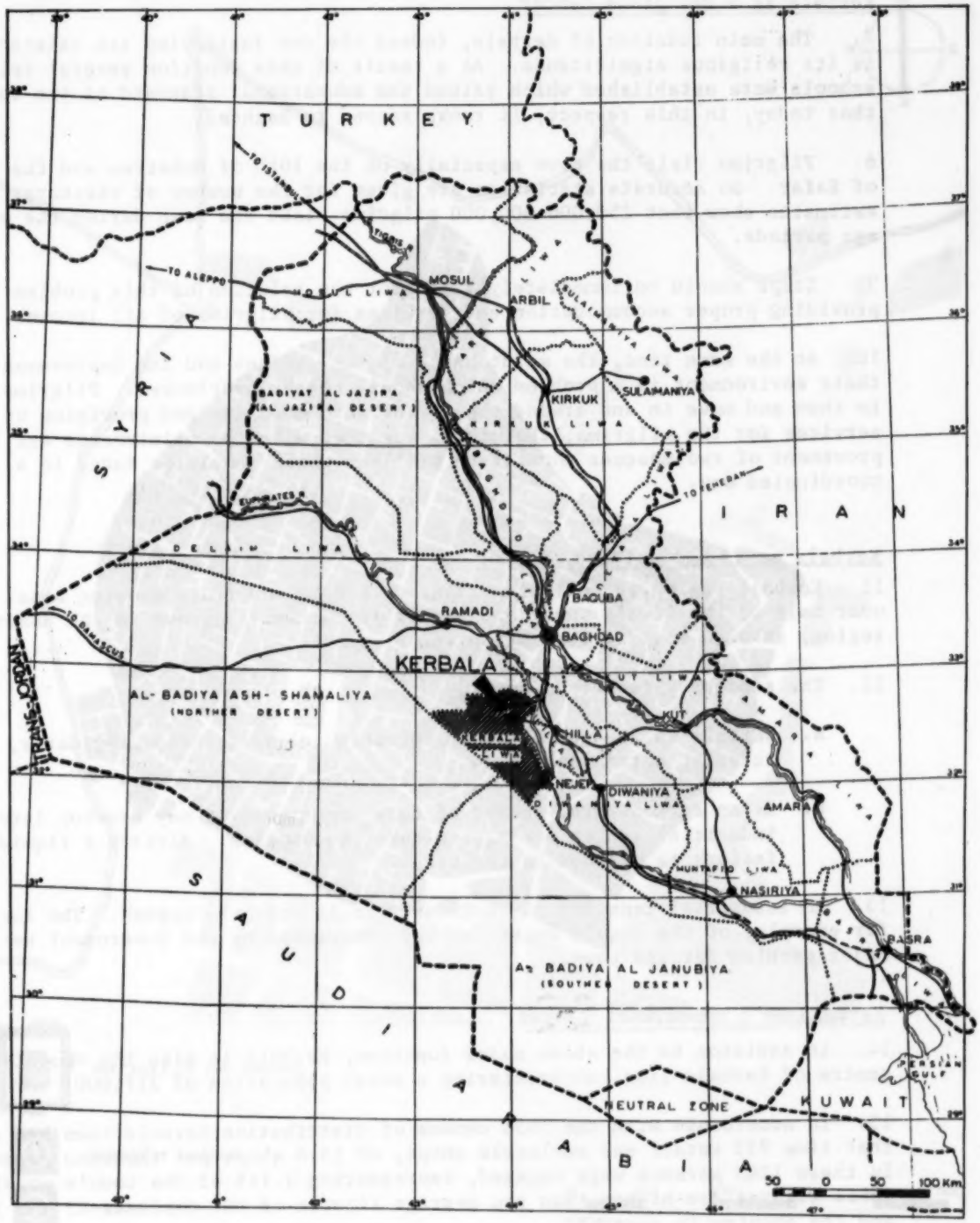
THE PROBLEMS

6. Kerbala has two over-riding problems:

   a. The existing conditions in the old part of the town where congested habitation, lack of sanitary facilities, dilapidated and very old houses, the resulting health conditions etc., characterize it as one with the lowest standard in Iraq, a standard which cannot be uplifted by the implementation of any kind of amelioration activities in the area without radical and expensive measures.

   b. The tremendously big number of pilgrim influx in Kerbala which is directed towards the old town and the two shrines.

LOCATION OF KERBALA



The future of Kerbala, Iraq. --2

Kerbala as a Religious Center

7. The main function of Kerbala, indeed the one justifying its existence, is its religious significance. As a result of this function several religious schools were established which raised the educational standard of the town so that today, in this respect, it ranks second to Baghdad.

8. Pilgrims visit the town especially on the 10th of Muharran and the 20th of Safar. No accurate statistics are given for the number of visitors; rough estimates show that 250,000-500,000 pilgrims visit the town during the pilgrimage periods.

9. Steps should be immediately taken for the solution of this problem by providing proper accommodation and services for pilgrims of all incomes.

10. At the same time, the maintenance of the shrines and the improvement of their environment is a problem which should not be overlooked. Pilgrims come to them and move in and around them. The accommodation and provision of services for the pilgrims, therefore, together with the maintenance and improvement of two mosques constitute problems which should be faced in a coordinated way.

Kerbala as an Agricultural Center

11. Kerbala region is quite important as a date and fruit growing area. Well over half of the liwa's wheat and barley production is grown in the Husseiniya region, as also most of its cotton and rice.

12. The secondary functions are:

a. Kerbala is the center of an agricultural area, producing dates, fruits, cereals, cotton and rice.

b. As an agricultural center of some importance it may develop into an industrial center for agricultural industries. Already a liquid sugar factory is planned in the city.

13. An industrial zone for major industries is urgently needed. The location, for example, of the liquid sugar factory programmed by the Government became a major problem for the town.

Kerbala as a Commercial Center

14. In addition to the above major function, Kerbala is also the administrative centre of Kerbala liwa, administering a total population of 217,000.

15. In accordance with the 1956 census of distribution Kerbala town had at that time 933 retail and wholesale shops, or 15.8 shops per thousand persons. In these 1245 persons were engaged, representing 2.11% of the town's population. These figures are higher than the average figures of the capitals of the liwas and the country in general.

THE OLD TOWN BEFORE THE OPENING OF NEW STREETS

The future of Kerbala, Iraq. --3

16. A wide range of commercial activities is covered by shops and establishments offering services, i.e. coffee houses, barbers, laundries. Thus 515 establishments engaging 1133 persons, existed in the town in 1957 or 8.8 shops per 1000 people.

17. The big number of shops and services noticed in Kerbala is due to the excessive commercial activities resulting from the thousands of pilgrims who visit the city.

18. A large number of shops are grouped in souks in the vicinity of the two mosques. The remaining commercial shops are situated on both sides of the main streets of the town, the pavements of which are covered with arcades, most practical for this hot climate. The business central area extends towards the south, following the direction of the expansion of the town. Wholesale business is carried out in the west peripheral road of the old town.

19. The present commercial and business area is congested and causes enormous traffic problems.

Kerbala's Housing Problems

20. Residential areas: Three main residential districts exist. The first is around the commercial centre of the old town, with the highest densities, and in many cases intermingled with commercial establishments, the second is located in the north part of the middle town with lower but, nevertheless, high densities, and the third is the new district of Husseiniya, a purely residential area, with very low densities.

21. Some small residential units for higher income groups are scattered in the southern part of the middle town.

22. Two small sarifa districts are situated at the north entrance of the old town and the south-west districts of the middle town.

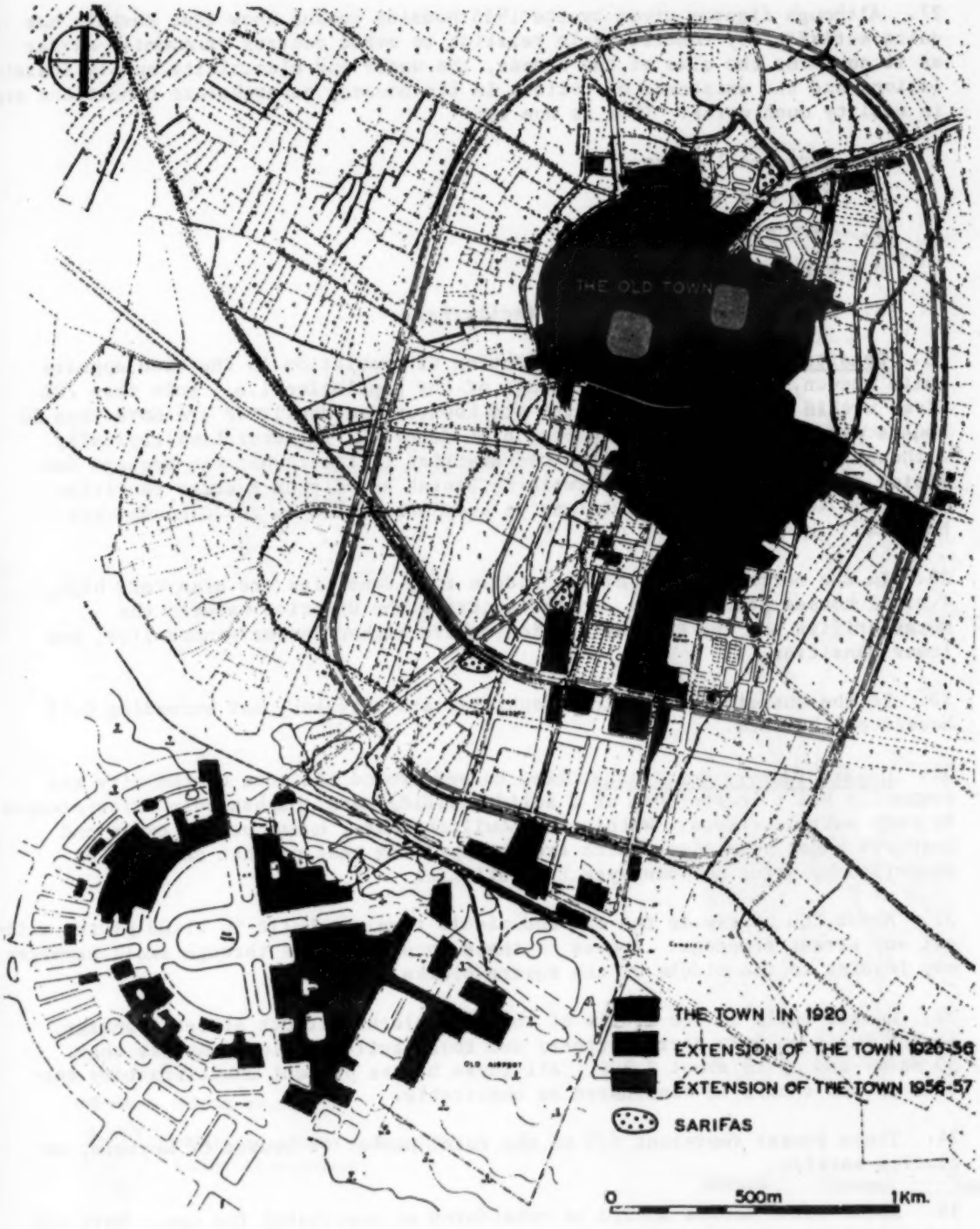
23. In 1956 1.22 families corresponded to each houses in Kerbala. This figure is more or less equal to the average figure of all the liwa capitals of the country, viz. 1.19 families per house. The corresponding figure for Iraq in general is 1.07, but this last figure includes the rural areas also.

24. The average number of persons living in one house in Kerbala in 1956 was 6.91. This figure is lower than the average for all the capitals of the liwas, 7.18 persons, but higher than the national average, 6.03 persons.

25. The average number of persons per room was 2.05. The average ratio for the liwa capitals was 2.69 and for the whole country 2.75.

26. Kerbala, together with Nejef, are the only two major centres where brickwork is used very extensively. Indeed 89.51% of the houses are built of brick and only 1.69% of stonework. 0.91% are mud houses, 7.31% sarifas and 0.57 are mixed constructions.

THE GROWTH OF KERBALA



The future of Kerbala, Iraq. --4

27. Although figures given by the 1956 housing census show that Kerbala has quite satisfactory conditions in relation to other centres of country as far as it concerns the size of the houses, the water and electricity supply installations and the existence of toilets in its houses, nevertheless conditions are in reality much worse. This is due to:

a. Very small plots

b. Very old houses

c. Very high densities

d. Very narrow streets

e. Lack of proper community facilities.

28. Densities. The present distribution of population in the town appears quite uneven. The greater percentage of the population i.e., more than 70% lives within the boundaries of the old town, where densities are more than 80 houses per hectare. This is a very high density. In other Liwa capitals, although there are overpopulated old district in the towns, the average densities are much lower. For example in Basrah and Kirkuk average densities are about 40-60, while in Sulaimaniya they are as low as 20-30 houses per hectare.

29. In the northern parts of the middle town densities are also very high, i.e. 62 houses per hectare. On the contrary the district between the Mutassarifiya and the Railway Station, where higher income groups live, has lower densities.

30. In the Husseiniya district, densities are very low, not exceeding 8.75 houses per hectare.

31. Unsatisfactory Conditions. These houses around the core of the city are compactly built in the form of a solid building mass, haphazardly criss-crossed by very narrow streets. Within this building mass, human beings exist and survived under conditions which are so appalling that neither can they be described by words nor conveyed by statistics.

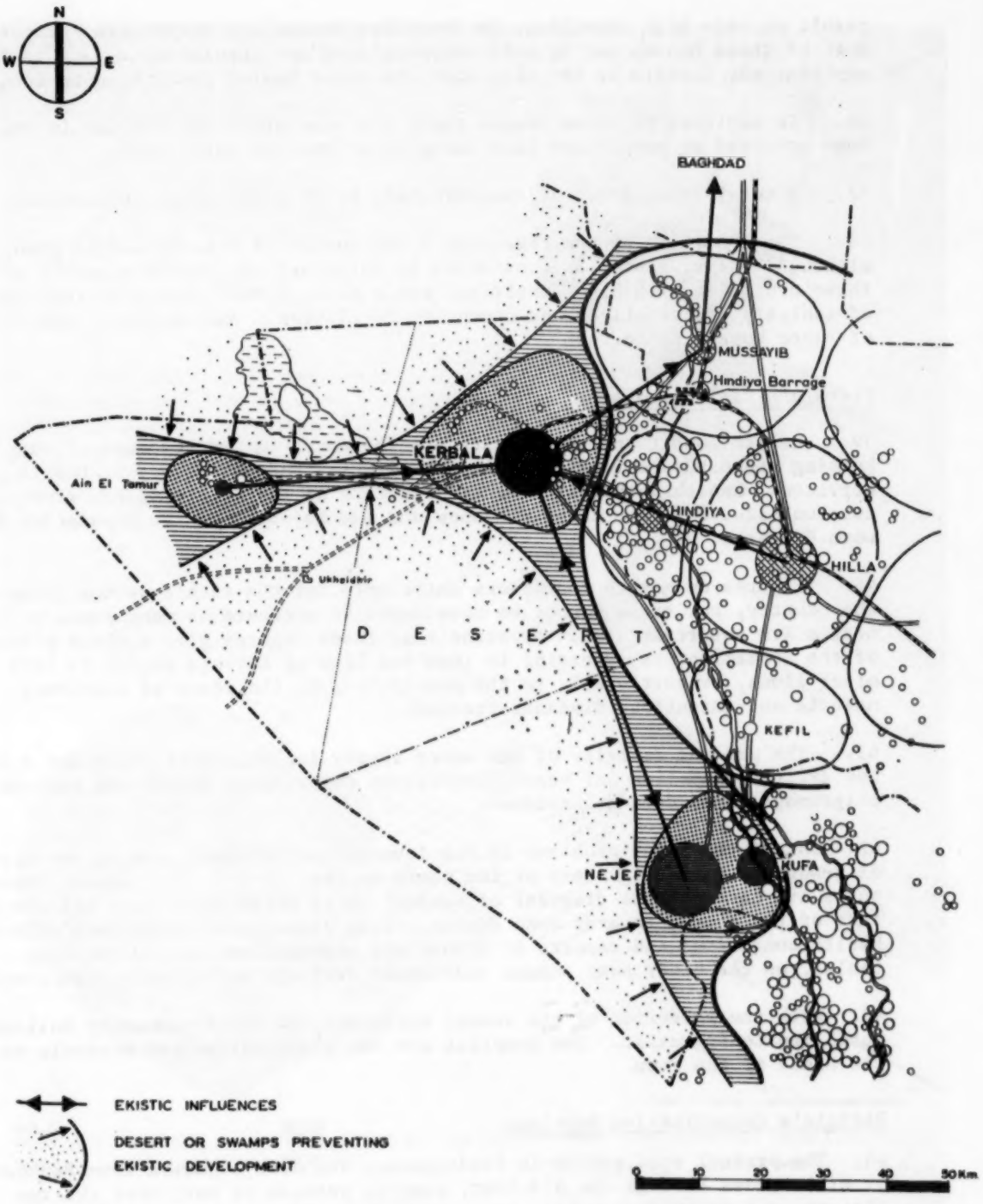
32. About 800 houses in the old and middle town are built in blind plots, without any street frontage. Access to these houses is made through small passageway leading to the middle of the square blocks.

33. Houses built in the middle of the city blocks without street frontage, houses built on very narrow streets and those built on plots smaller than 50 sq.m. add up to about 3,900. All these houses present unsatisfactory conditions and should be considered as unsuitable.

34. These houses represent 65% of the total number of houses of Kerbala, excluding sarifas.

35. About 3,900 houses should be considered as unsuitable for use. Very old and dilapidated houses which are built in very narrow streets, a lot of which are dead-end, or on very small plots, in many cases without any street frontage,

EKISTIC STRUCTURE



result in very high densities, in densities beyond any acceptable standard. Most of these houses can be neither ventilated nor insolated, a fact that explains why Kerbala is the city with the worst health conditions in Iraq.

36. In addition to these houses there are also about 500 sarifas in the town occupied by people who have immigrated from the rural areas.

37. A total, therefore, of approximately 4,400 houses need replacement.

38. The condition of the remaining 2,000 houses of the old middle town, although better, cannot be considered as satisfactory. Quite a number of these are built with high densities, while most of them need both improvement of sanitary installations and community facilities. Amelioration, therefore, of these houses is needed.

Kerbala's Health Problems

39. Health conditions in the city are the worst in Iraq because of very low housing standards, epidemics caused by pilgrims and inadequacy of health services. Health authorities mention that 7% of the people suffer from tuberculosis, 25% from chest diseases and the majority of the population from worm diseases.

40. Figures on health conditions exist only for the totals of the liwas of the country, but these cannot be considered as accurate as many cases of illnesses are not registered. Nevertheless, these figures give a clear picture of the situation, as according to them the liwa of Kerbala topped in 1956 all other liwas, proportionally to the population, in the cases of trachoma, malaria and infectious diseases treated.

41. The present capacity of the water supply installations allow for a very low daily consumption per head. Conditions deteriorate during the periods of pilgrimage, when demand increases.

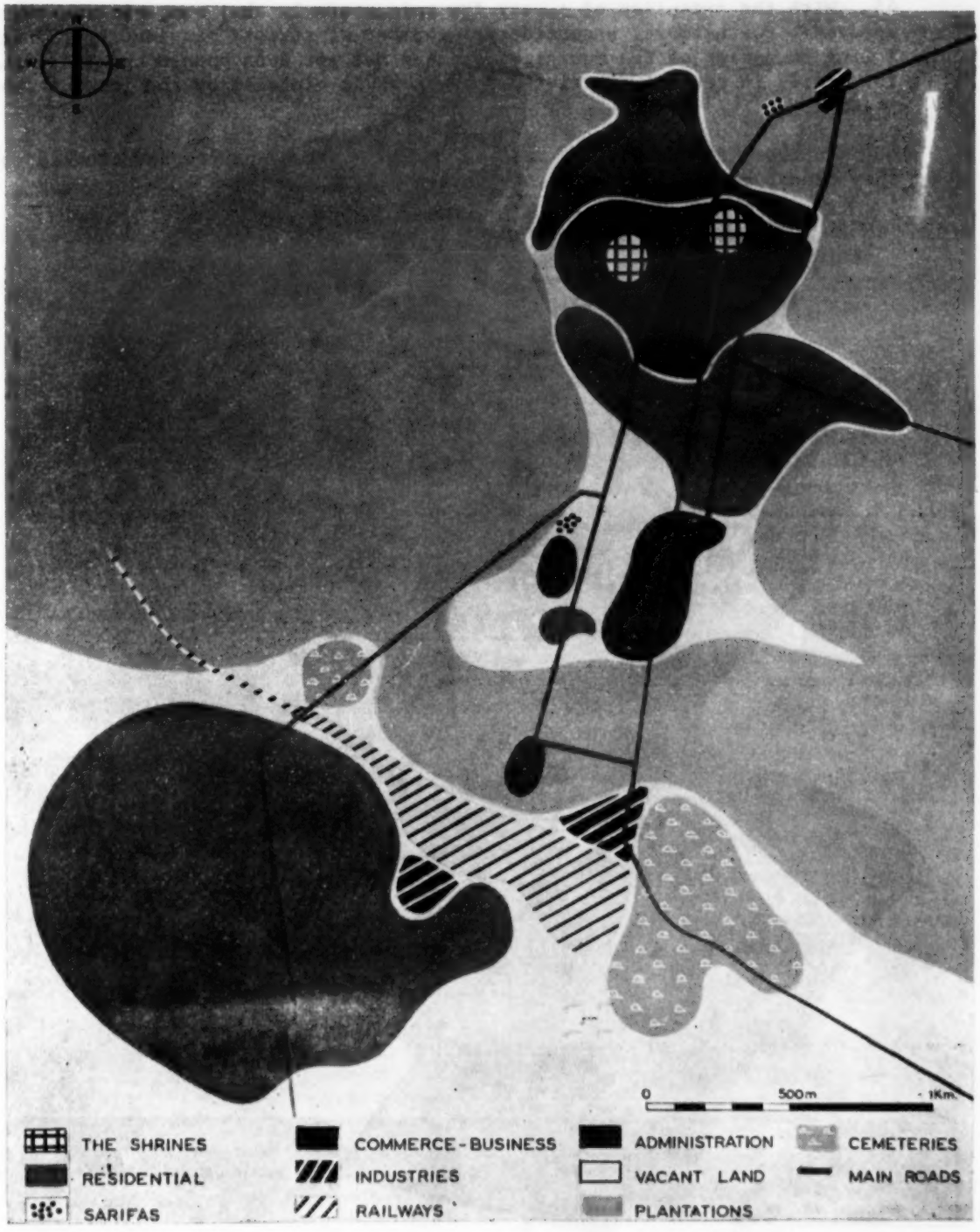
42. One of the major problems of the town is the complete lack of any type of sewerage, either sanitary or for storm waters. Everywhere cesspools are used for the disposal of sewage, while storm water runs off the surface of the ground towards open drains. This arrangement definitely affects health conditions and results in floods and stagnant waters. High water tables, on the other hand, cause additional drainage and construction problems.

43. With the exception of the school buildings, no other community buildings worth mentioning exist. The hospital and the dispensaries can scarcely serve the needs of the town

Kerbala's Communication Problems.

44. The present road system is inadequate. The main highways from Baghdad or Hilla cross through the old town, passing between or very near the two shrines, and cause congestion, especially during the period of pilgrimage. This congestion becomes even worse as no parking facilities exist in the area. The only existing parking facilities near the Mutassarifiya are of entirely minor importance and cannot be taken seriously into consideration.

HOMOGENEOUS AREAS IN KERBALA



The future of Kerbala, Iraq. --6

45. With the exception of a very few main roads in the town, all the rest are unpaved. Furthermore, a considerable number of streets provided by the existing town-plan of the municipality have not yet been opened up. Traffic, therefore, in several districts of the town is hindered by the lack of proper roads.

46. In the old town itself, most of the roads are so narrow and crooked that they cannot serve any traffic other than pedestrian.

HOUSES WITHOUT STREET FRONTAGE

DOXIADIS ASSOCIATES - CONSULTING ENGINEERS

The future of Kerbala, Iraq. --7

THE POLICIES

The Functions of Kerbala.

47. The future main functions of the town will remain the following:

a. Religious center of pilgrimage.

b. Religious education center.

c. Administrative center of higher order.

d. Agricultural center with potentialities for development of agricultural industries.

e. Commercial center serving a minor population outside it.

The Growth of Kerbala.

48. Iraq is passing through a period of tremendous development which will result in the change of its economic and social structure. The improvement of living conditions and the uplift of living standards may affect the natural increase of the population. It is an observed phenomenon that the more the economic and social standards rise, the more the rate of increase of the population drops. This does not happen through in the first phase of the improved conditions, as death rates fall before the decline of the birth rates. To predict, therefore, the exact time at which the population of Kerbala will be doubled is impossible. It can only be said that it will probably occur sometime in the next 20-30 years, while the population of Iraq may double in 25-35 years.

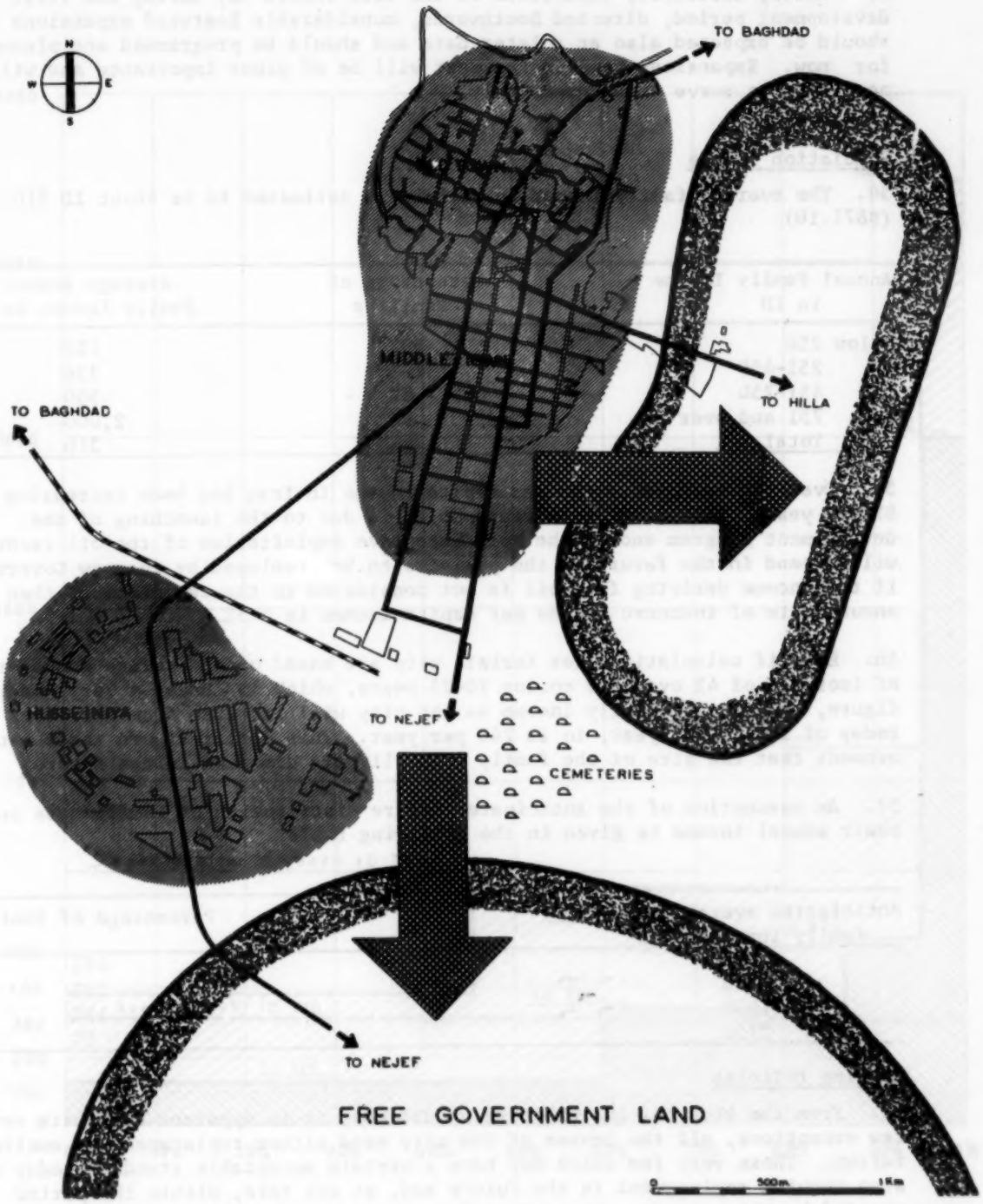
49. The long-term master program should take into consideration the above thoughts regarding the increase of population. To have this program safely based, planning should be done for a double population, independently of the exact time of the realization of this figure.

50. It is worth mentioning here that the importance of Kerbala for the whole country and its significance as a religious center of the entire Shiite world will increase in the future. New communications, improvement of transportation means and higher economic standards will bring more and more pilgrims each year who will need more services from the city.

51. For the time being, all areas adjacent to the town and lying West, North and East of its present site are covered by plantations. Only its Southern parts are free unexploited lands. This is one strong reason why so far the city was developing towards this direction. On the other hand large tracts of government-owned lands are available towards the same direction, a matter which justifies programmed development towards that end.

52. Kerbala is influenced furthermore by the towns of Hilla and Nejef and by the main highway Baghdad-Basrah. Kerbala has considerable commercial ties with Hilla and administrative ties and ties of common religious pilgrimages with Nejef. Further main import and export centres are Baghdad and Basrah, the former being additionally the higher order administrative centre.

TRENDS FOR THE PHYSICAL EXPANSION OF THE TOWN



53. While, therefore, expansions of the town should be, during the first development period, directed Southwards, considerable Eastward expansions should be expected also at a later date and should be programmed and planned for now. Expansions towards the West will be of minor importance and will be necessary to serve local needs only.

Population Income

54. The average family income in Kerbala is estimated to be about ID 310 ($871.10)

Annual Family Income in ID	Percentage of Families	Average Annual Family Income in ID
Below 250	60%	126
251-450	27%	336
451-750	8%	550
751 and over	5%	2,000
Total	100%	310

55. Over the last years the per capita income in Iraq has been increasing by 8% per year. This rate of increase, which is due to the launching of the development program and to the more intensive exploitation of the oil resources, will depend in the future on the policies to be developed by the new Government. If the income deriving from oil is not considered in the calculations then the annual rate of increase of the per capita income is 5.5%.

56. Even if calculations for Kerbala city are based on an average annual rate of increase of 4% over the coming 20-25 years, which is indeed a very moderate figure, the average family income in the city will increase from its level of today of ID 310 per year, to ID 740 per year. This latter figure takes into account that the size of the family will slightly diminish in the future.

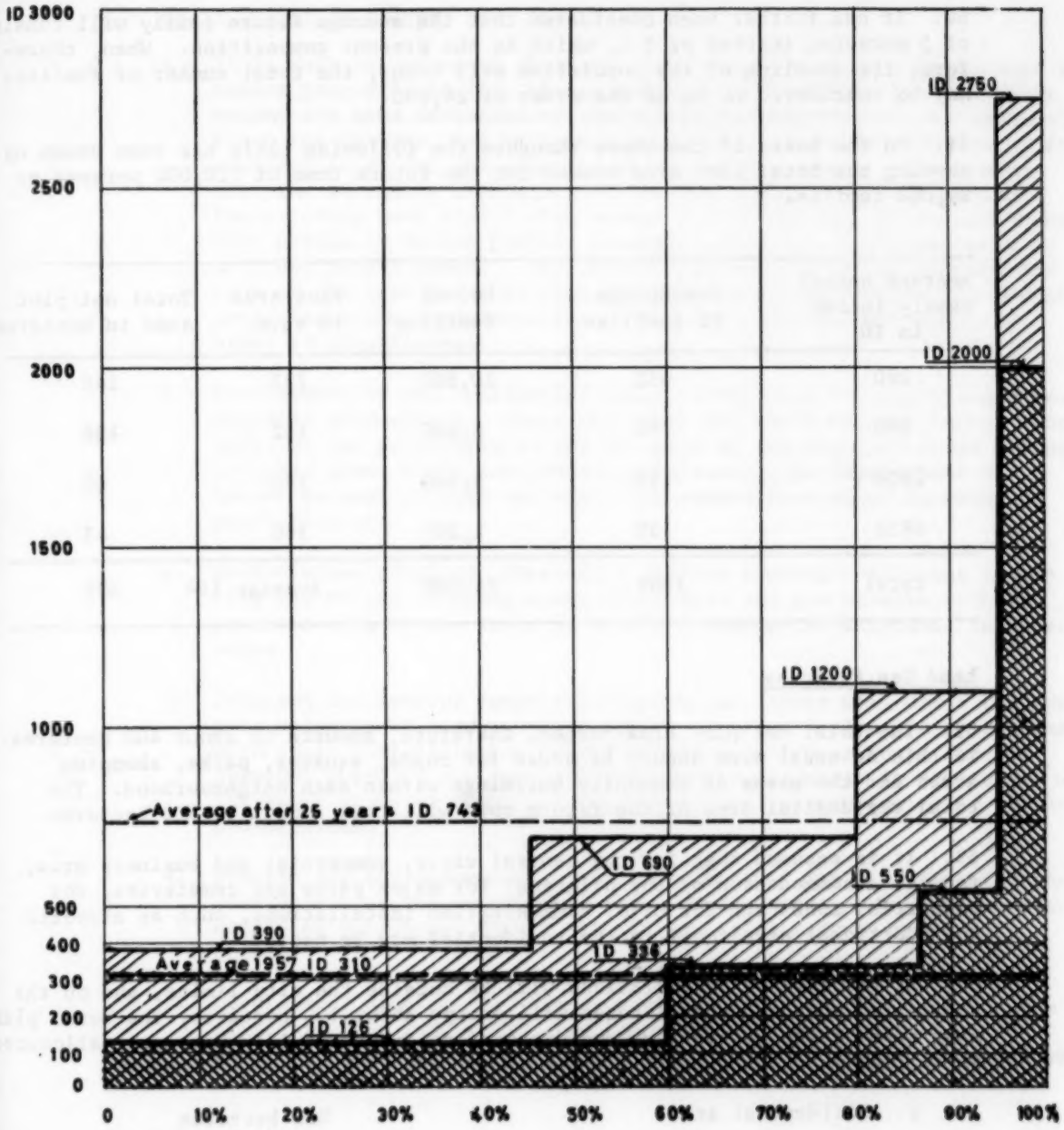
57. An assumption of the anticipated future distribution of families as per their annual income is given in the following table:

Anticipated average annual family income in ID	Percentage of families
390	45%
690	35%
1200	15%
2750	5%

Housing Policies

58. From the study of the existing conditions, it is apparent that with very few exceptions, all the houses of the city need either replacement or amelioration. Those very few which may have a certain acceptable standard today will also require replacement in the future and, at any rate, within the period covered by the program. It is therefore natural to base the estimates of the total needs of the future town on the assumed figure of 120,000 inhabitants.

PRESENT AND ESTIMATED FUTURE DISTRIBUTION OF FAMILIES IN ACCORDANCE WITH THEIR ANNUAL INCOME



59. To estimate the total residential area, plot areas have been considered to range from a minimum average of 135 sq.m., for the lowest income groups, to a maximum average of 360 sq.m. for the higher income groups.

60. It has further been considered that the average future family will consist of 5 persons, instead of 5.6, which is the present composition. When, therefore, the doubling of the population will occur, the total number of families may be considered to be of the order of 24,000.

61. On the basis of the above thoughts the following table has been drawn up showing the total plot area needed for the future town of 120,000 persons or 24,000 families:

Average annual femily income in ID	Percentage of families	No. of families	Plot area in sq.m.	Total net plot area in hectares
390	45%	10,800	135	146
690	35%	8,400	162	136
1200	15%	3,600	190	68
2750	5%	1,200	360	43
Total	100%	24,000	Average 164	393

Land Use Policies

62. The total net plot area needed, therefore, amounts to about 400 hectares. To this an equal area should be added for roads, squares, parks, shopping areas and the needs of community buildings within each neighbourhood. The total residential area of the future town will thus amount to 800 hectares.

63. It is assumed that for the central civic, commercial and business area, for the accommodation of the pilgrims, for major parks and cemeteries, for industrial zones and for major communication installations, such as airports, an additional area equal to the residential may be needed.

64. As the airport installations will be outside the city limits, and on the assumption that industrial zones will occupy about 150 hectares, the total planning area of the future town would therefore amount to 1350 hectares, allocated as follows:

a.	Residential area	800 hectares
b.	Civic, commercial, business, pilgrims, parks, cemeteries	400 "
c.	Industrial area	150 "
	Total planning area:	1350 hectares

The future of Kerbala, Iraq. --10

If we add to this figure, the area needed for the airport and some other installations of general use, the total area will be 1600 hectares.

65. Major Policy Decisions

a. It is safe to recommend that the old part of the town should, over the master program's period, change entirely its function and gradually become the area dedicated to the religious functions of the town only, where the shrines, the religious, educational and other institutes and the facilities for the pilgrims will be accommodated. This means that the ownership conditions of the whole area of the old part of the existing town should also change and everything within its boundaries gradually become public, belonging either to the Government or to other public bodies. The above considerations regarding the old part of the town together with the other existing problems of Kerbala necessitate the implementation of the following sub-programs, by order of significance.

b. Development of new residential areas, consisting of complete and integrated communities. These will meet the needs of the gradual overspill of the population of the old part of the town, of those living in other areas under substandard conditions, the replacement of houses because of wear and tear, the demand because of increase of population, etc.

c. Amelioration programs. These will improve housing conditions in the very few of the existing areas which will and can survive. These programs will mostly refer to works of community facilities in these areas.

d. Programs for general community facilities. These will cover the general main networks of roads, water supply, sewers and electricity together with their installations. These programs will be planned for the eventual needs of the town and implemented gradually in accordance with the needs deriving from the progress of the implementation of the other sub-programs.

e. Program for the accommodation and servicing of the pilgrims, for the development of the central area and for the erection of higher order community buildings, for the improvement of the areas around the shrine.

f. Development programs for the creation of industrial estates for the attraction and functional grouping of industries. These estates should be established outside the town, in areas easily connected with transport facilities and neighbouring with low-income communities.

Financial Policies

66. For the realization of the plan all available resources should be estimated. These estimates should cover private, government and all other possible sources. The total investment needed should be financed by all these parties in accordance to the importance and nature of investment.

The future of Kerbala, Iraq. --11

a. Projects of national importance will thus be financed by the Government. Such projects are highways, general projects for industrial development, railways and other higher order transportation means, general hospitals, schools and higher order community buildings, certain accommodation for the pilgrims etc.

b. Projects of local importance should be financed by local administration. These also include certain facilities for the pilgrims.

c. Houses, shops, etc., should be financed by private initiative. To facilitate action, the Government may finance to a certain extent these projects and charge their cost to the individuals with financial facilities.

d. The Government should subsidize several important municipal works at the initial stage of the program.

e. The Government should also subsidize low-income housing schemes.

f. Contributions by the Wakufs for the development of the shrines may be anticipated.

g. Contributions for the development of the shrines etc., by the international Shiite world may also be anticipated.

67. Of the above investments, the following may be assumed as concerning ekistic development:

a. Government

Housing		ID 3,600,000
Other buildings, military excluded		" 2,300,000
Other constructions		" 1,500,000
Transport		" 2,600,000
	Total	ID 10,000,000

b. Private

Housing	ID 12,200,000
Other buildings	" 1,300,000
Other constructions	" 500,000
	ID 14,000,000

68. In the year 1936 ID 24 million were spent all over Iraq for ekistic projects: ID 10,000,000 of this by the Government and ID 14,000,000 through private initiative.

The future of Kerbala, Iraq. --12

69. On the basis of the population of the centers with more than 10,000 inhabitants, Kerbala's share out of these ID 10 million is estimated to be ID 350,000. This figure may be divided into:

a.	Government and municipal initiative	ID	150,000
b.	Private initiative	"	200,000
	Total	ID	350,000

70. Taking into account that in 1956 Kerbala municipal authorities granted 200 licenses for new houses and 513 for repairs, and on the assumption that the average expenditure for each new house was ID 1,000 and for each repair ID 60, the total sum invested for housing in the city in 1956 by private initiative amounted to about ID 230,000, a figure justifying the above assumptions.

71. On the assumption that Government investments for ekistic development each year will increase by 10% and that private ones will increase by 8%, the total amount of ID 55 million needed for the realization of Kerbala's program will be accumulated in 32 years, or within a period longer by 7 years than the minimum time required for the doubling of the population.

72. It is noticeable that from the Government allocations programmed for 1956 for ekistic developments, only 15.0% were made for housing while 85% had been scheduled for other urgent ekistic works. This ratio between the allocations programmed for housing and for other ekistic developments cannot be considered wise or reasonable.

73. Such a ratio is justified in countries where housing standards are high and housing conditions relatively satisfactory. The Governments of these countries aim to improve other sectors of ekistic development by financing better community buildings, and more advanced community facilities, etc. For countries like Iraq, however, where there is a great shortage of houses, 80% of which are built of mud, and consequently millions of people live under substandard conditions, this ratio should be different. The Government cannot afford to invest amounts for town improvement and embellishment works without first solving the housing problem. Housing should get a much bigger share of the amounts allocated for ekistic development.

74. On the basis of the above assumptions and on a total annual program of ID 100 million, which is the approximate annual average of the first five-year progran, allocations for ekistics should, therefore, be ID 20 million or

ID 10 million for housing projects

ID 10 million for development projects other than housing in the major urban centers, and for other ekistic projects of a general character.

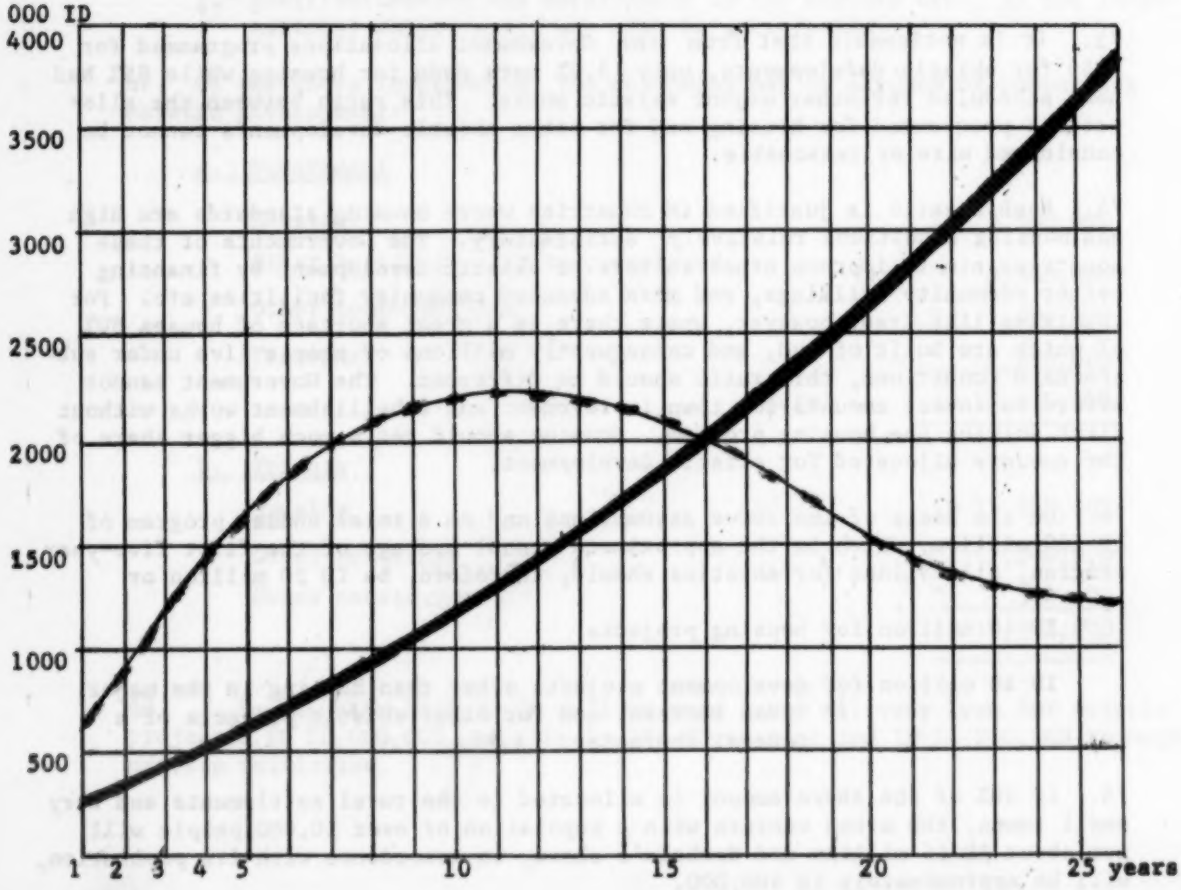
75. If 30% of the above amount is allocated to the rural settlements and very small towns, the urban centers with a population of over 10,000 people will get about ID 14 million and Kerbala's share, in accordance with its population, will be approximately ID 400,000.

The future of Kerbala, Iraq. --13

76. Therefore, commencing the implementation of Kerbala's development program with a Government annual allocation of ID 400,000 and with a total private investment of ID 200,000, and assuming that these amounts will increase each year as already mentioned by 10% and 8% respectively the total sum of ID 55 million, needed for the realization of the program, can be accumulated within a period of about 25 years.

77. It should though be borne in mind that the big effort for the realization of any long-term program must be made during the first years of that program, for example during the first ten years. Urgent needs will be met at a faster rate, and the continuation and success of the program ensured, if at the beginning of the Program the amounts alloted by the Government will be as high as possible. It pays the Government, for example, to acquire all land needed for the development of the town at an early stage and before its value increases.

78. On this basis the following graph has been constructed. One curve shows the Government annual allocations for a period of 25 years increasing by 10% each year. The other curve shows the Government allocations desired. This provides for a greater effort in the first years, allowing for the early acquisition of land thus providing for the realization of the first stage program within the stated time.



The future of Kerbala, Iraq. --14

THE PROGRAMS

The Master Plan

79. In accordance with the policies set out above, the Preliminary Master Plan has been drafted in an effort to solve the existing problems. This plan aims at serving an eventual population of 120,000, permanently residing in the city, further to the visiting pilgrims, whose number will increase in the years to come.

80. The plan covers the whole area of the existing town and provides for eleven completely new residential communities and an industrial zone.

81. The total area of the plan is approximately 1,400 hectares, as follows:

a.	Residential areas	850 hectares
b.	Central area	100 "
c.	Shrines, pilgrim accommodation, parks, cemeteries	300 "
d.	Industrial zone	150 "
	Total	1,400 hectares

82. As shown on the plan, extensions of the town have been made mainly towards S and E.

83. The old part of the existing town is dedicated to religious purposes. Accommodation, services and amenities for the visiting pilgrims will be developed in this area in conjunction with the two mosques.

84. The industrial zone has been set apart at the SE of the town. Its location in this area is indicated as prevailing winds blow from NW and, therefore, any smoke etc. coming from the factories will be blown towards the desert. This side can also be easily served by the main roads and is situated mainly on desert land.

85. All new developments are designed on a rectangular pattern. Any further expansions of the town beyond those provided by the Master Plan may, therefore, be easily added. Such additions will be needed in the future, during a second big phase of Kerbala's development. They might also be required earlier should any unforeseen factors demand more land for expansion than that provided by the Master Plan.

The First Stages

86. During a first five-year program the most urgent needs should be covered and the foundations of the long-term program laid. During the first period of action it is believed that the following projects should be carried out:

The future of Kerbala, Iraq. --15

a.	Residential units (new houses), Government initiative	1,500 units
b.	Residential units (new houses), private initiative	1,500 "
c.	Amelioration, Government initiative	1,000 "
	Total	4,000 units

87. At the same time, the following projects should also be carried out:

a. Development of 1,500 plots through Government initiative, to direct and influence private building activity and provide services for the houses which will be built through private initiative.

b. General community facilities to serve the projects of the present and the previous paragraph.

88. In addition, the following programs should commence, but not be completed, through Government, municipal or combined initiative:

a. Accommodation of pilgrims, namely, camps with services and hostels.

b. Community buildings of higher order, mainly hospitals.

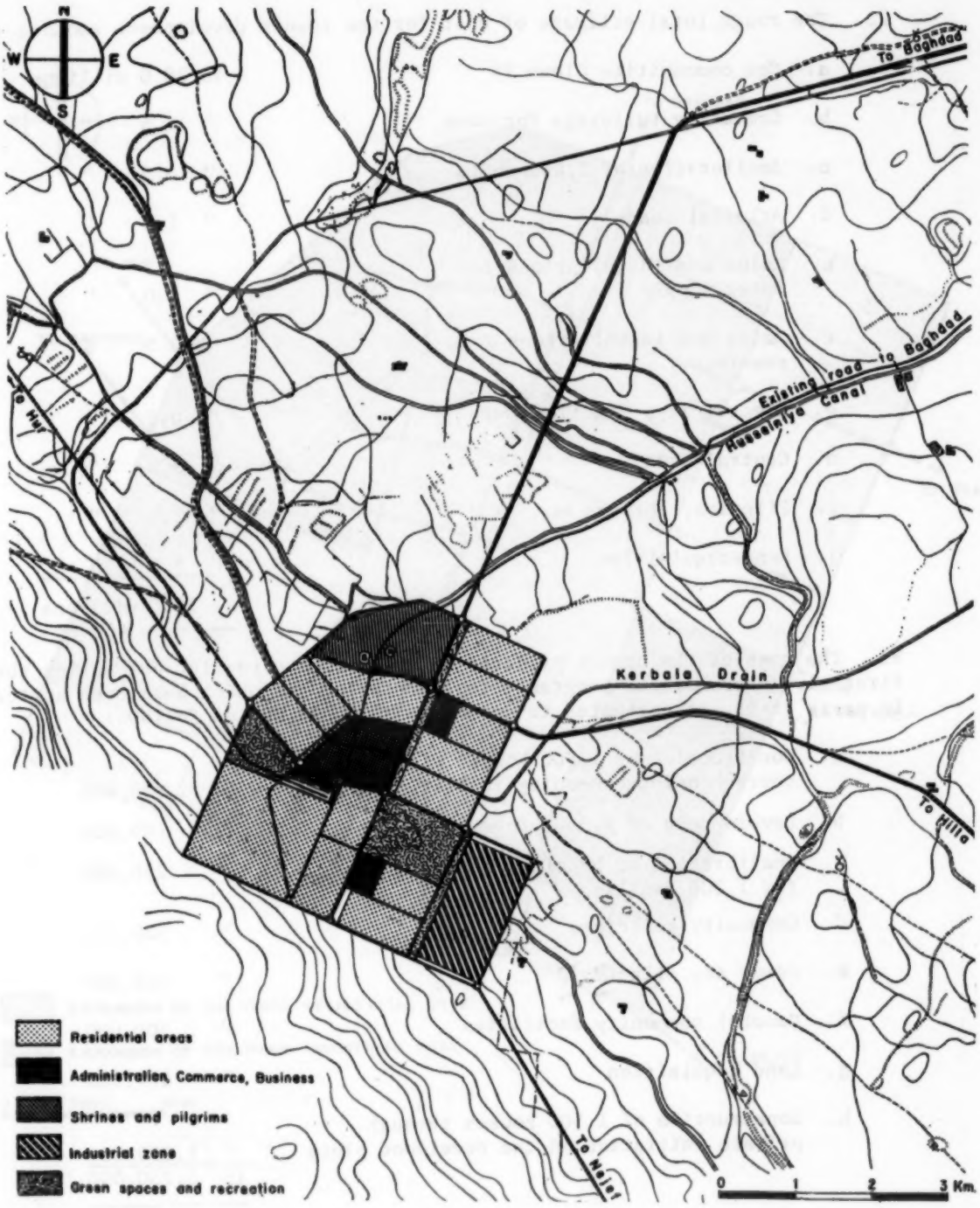
c. First improvement of the area of the shrines, and demolition of the houses of the old part of the town which will be vacated because of movement of their occupants to new houses in new districts.

89. Amelioration should commence in the area lying between the shrines and the central area, and new houses initiated by the Government should be erected in the Southern communities where the Government land lies.

90. During the second five-year plan the target should be to complete all the Southern communities by new houses, the amelioration of Husseiniya district, the continuation of the works for pilgrim accommodation and the erection of complete public administration and higher order community buildings.

91. It is understood that the general community facilities will be expanded to serve the new areas and needs.

THE PROPOSED MASTER PLAN OF KERBALA AND THE SURROUNDING REGION



The Programs

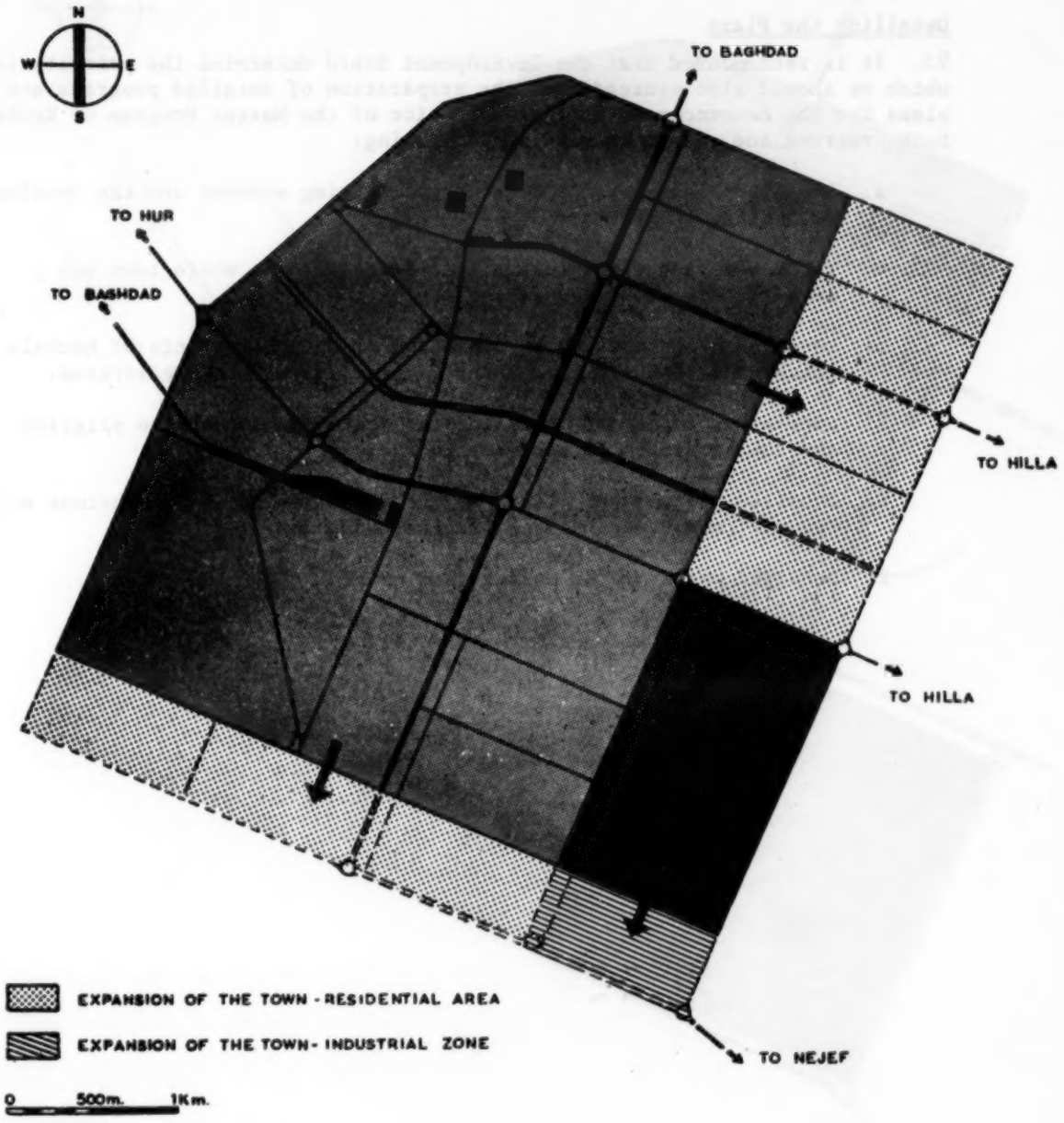
92. The rough total estimate of cost for the town's development amounts to:

a.	New communities Class IV	ID 30.0 millions
b.	Community buildings for same	" 4.5 "
c.	Amelioration of 2,000 units	" 0.5 "
d.	Arterial roads	" 1.0 "
e.	Mains and installations for water supply	" 1.0 "
f.	Mains and installations for sewerage	" 3.5 "
g.	Electricity, High Tension	" 0.5 "
h.	Central area	" 7.0 "
i.	Pilgrims, shrines etc.	" 2.0 "
j.	Land acquisition	" 5.0 "
	Total	ID 55.0 millions

93. The cost of the urgent projects which should be carried out during the first give years of the program's implementation and which have been stated in paras 86-88, is estimated to amount to ID 5,520,000 as follows:

a.	Construction of 1,500 houses with corresponding community facilities	ID 1,750,000
b.	Development of 1,500 plots	" 500,000
c.	Amelioration of housing conditions for 1,000 families	" 250,000
d.	Community buildings	" 500,000
e.	Camps for pilgrims	" 250,000
f.	General community facilities	" 500,000
g.	Land acquisition	" 250,000
h.	Construction of 1,500 houses through private initiative on the developed plots	" 1,250,000
		ID 5,250,000

THE MASTER PLAN OF KERBALA - POSSIBILITIES FOR FURTHER EXPANSIONS



94. Out of this total cost ID 4,000,000 would be constructions carried out on Government initiative and ID 1,250,000 constructions to be carried out through private initiative.

Detailing the Plans

95. It is recommended that the Development Board determine the priority in which we should also proceed with the preparation of detailed programs and plans for the commencement of implementation of the Master Program of Kerbala. Such programs and plans comprise the following:

a. Detailed plans for the creation of housing schemes and the development of housing in general.

b. Plans for general community facilities for the whole town viz., sewerage and water supply systems.

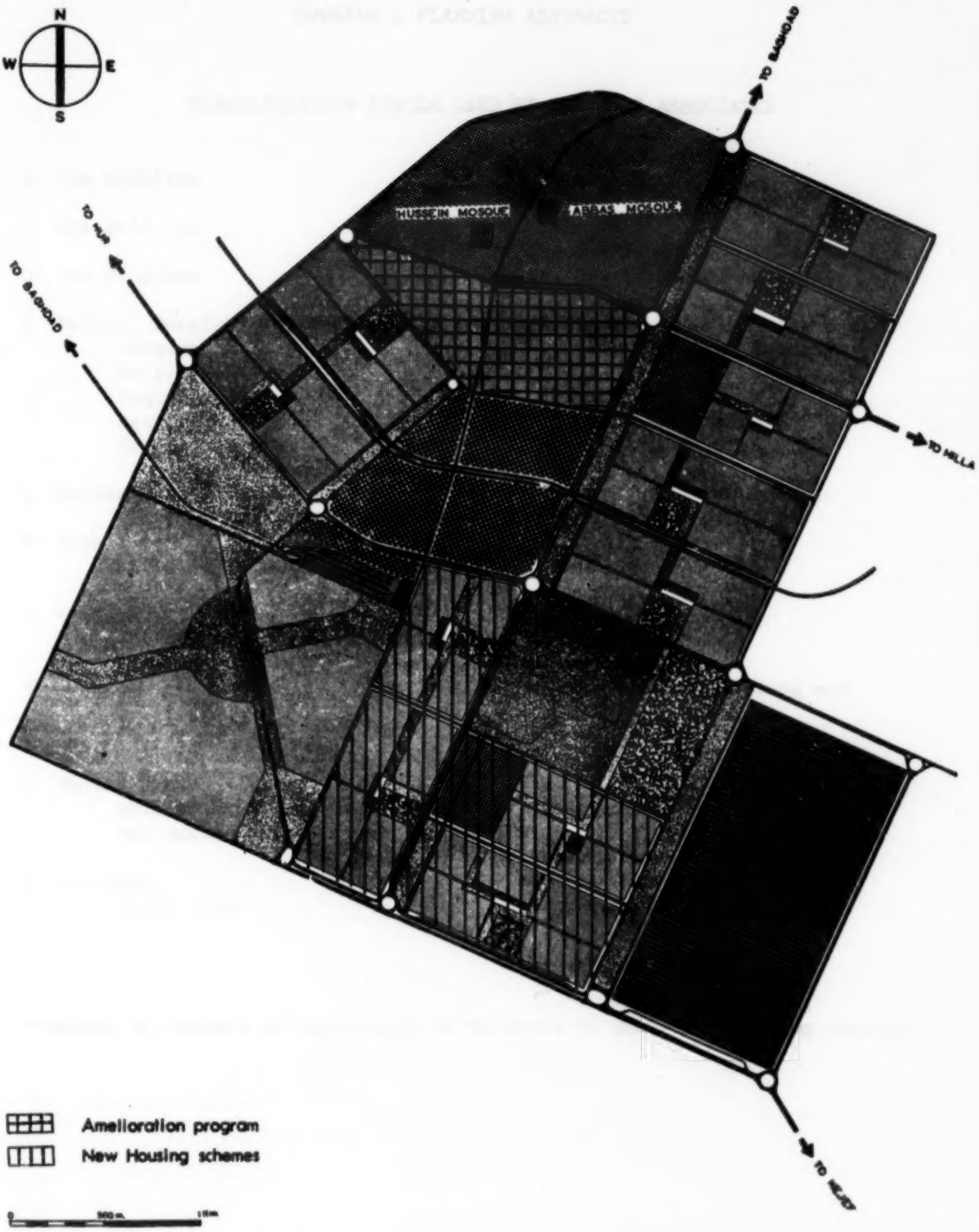
c. Detailed plans for the amelioration of those districts of Kerbala which, according to the Master Program, should be ameliorated.

d. Special programs and plans for the accommodation of the pilgrims and the provision of services to them.

e. Detailed program and plans for the preservation of the shrines and for the improvement of the area around them.

f. Detailed parts of the Master Plan combining all the above.

KERBALA MASTER PLAN - FIRST STAGE PROGRAM



DOXIADIS ASSOCIATES - CONSULTING ENGINEERS

E K I S T I C S

HOUSING & PLANNING ABSTRACTS

CLASSIFICATION SYSTEM USED BY DOXIADIS ASSOCIATES

A The Problems

B The Policies

C The Programs

D People, Development, and Ekistics**
- Geographic factors
- Social factors
- Industry
- Agriculture
- Transportation

E Houses

F Structures
(Exclusive of Houses)

G Community services
- Utilities and Social Services

H Regions

I Major urban centers

J Market towns
- Medium-sized and small towns
- New towns

K Villages
- Rural land

L Farms

M Surveys
- Census data
- Topographical surveys

N Research
(and Technical Education)

O Planning
(and Landscaping)

P Financing

Q Urban land

R Labor

S Materials

T Construction
- Systems of Building and Costs

U Implementation

V Management

W Administration

X Legislation

**Refers to centers of activities in relation to their surrounding regions.